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SURGICAL ASPECTS OF STONE IN THE URINARY TRACT

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The calculus disease of the urinary tract is probably as old as the human race itself. Recent archæological investigations on mummies in Egypt have proved that stones in the urinary tract existed as early as 5,000 B. C. It was believed even in those prehistoric days that impure food containing excess of insoluble minerals of the type of silica or sand was responsible for the formation of calculi.

Ætiology

In the vast literature on the subject, there is much that is conflicting and confusing. While great progress has been made in refinements in diagnosis and surgical treatment, yet, in spite of the great amount of work done, no adequate explanation, free from obvious objection and applicable to all cases, has been offered for the mechanism of stone formation. And I may remark further, that in the surgical treatment of urinary calculus we are dealing with the result of disease, repairing damage after it has occurred. A more rational therapy, based upon an appreciation of primary causes, of urinary lithiasis would be directed against the formation of stone and the prevention of recurrence after surgical removal. In this important respect our treatment of this condition, brilliant as it may seem, must be considered limited and unsatisfactory.

During the past few years a great advance has been made in our knowledge of the subject. A study of the composition of urinary calculi has shown that they are an aggregation of crystals held together by a cement substance. Therefore 2 factors have to be considered, *viz.*, (1) the presence of crystals in the urine and (2) the nature and origin of the cement substance.

The crystals entering into the composition of urinary calculi are those of uric acid, urates, phosphates and calcium oxalates, etc. These substances are markedly less soluble in water than in urine. Normally, from two to four grams of these crystalline substances are excreted daily in the urine. It is apparent that there is some peculiar property of the urine as a solvent whereby it can hold in solution greater amounts of these substances (urates, phosphates and oxalates) than distilled water. Furthermore, one frequently observes that a marked oxaluria and phosphaturia may continue for years without any tendency to stone formation. Such a urine deposits its oxalates, phosphates and urates etc. in the form of isolated crystals, which show no tendency to fuse into a stone. What is the explanation of this phenomenon? According to physical chemistry, this property of the urine is due to its true colloids,

which do not allow the crystals to adhere together. These colloids are normally present in the urine in small amount. Their exact nature and mode of action are not thoroughly understood. They are probably of the nature of mucin and urochrome but they are not albuminous. They have been termed true or reversible colloids (because when once precipitated they are rendered soluble again by the changed reaction of urine). By their action they constitute the normal protective mechanism against the formation of stone. Under some abnormal conditions, however, this protective mechanism is disturbed because of the production of some different types of colloids termed irreversible colloids which, when once precipitated, always remain insoluble. These irreversible colloids act as cement substance in binding the urinary crystals together to form a concretion.

What are the conditions that lead to the production of these irreversible colloids? In a recent experimental study of urinary lithiasis, Keyser has made an important contribution to the subject. He suggests that these irreversible colloids may result from the changes in the true or reversible colloids or they may occur as the result of some pathological processes in the body. The latter origin seems most likely. As a result of these abnormal irreversible colloids in the urine, precipitation and fusing together of the crystalline substances occur and a concrement is produced. Not every abnormal colloid introduced into the urinary stream will be associated with the formation of a stone. Were this the case, nephritis and pyelitis would consistently be associated with stone. From this it is argued that the stone forming irreversible colloids must be specific, and, if it be due to bacteria, the bacteria which produce it must be specific too. This conception of the bacterial origin of stone receives a strong support from the work of Rosenow (of Mayo Clinic) who further asserts that the specific activity and elective localisation of certain bacteria are the final words to the calculus formation. Rosenow and his co-workers have produced urinary calculi in animals by infecting their teeth with bacteria obtained from patients suffering from nephrolithiasis.

The possibility that calculi may form in the absence of infection should also be recognized. In about 11 per cent. of cases of nephrolithiasis there is no evidence of infection. Probably there are some conditions other than inflammatory ones which produce the irreversible colloids responsible for stone formation. How this takes place is not understood but remains for future investigators to determine.

One must clearly distinguish between the formation and growth of calculi. So far we have discussed the mechanism which initiates the process of chemical precipitation and fusion of crystals in the urinary tract. There are many factors which influence the growth of concrements, once the process has started—urinary stasis from various causes—congenital or acquired, stricture of the urethra, enlarged prostate, diverticula of the bladder and abnormalities of the kidney and ureter etc. are some examples. It has been claimed recently that stricture of the ureter is present in 90 per cent. of renal calculus cases (H. Hunner). There can be no doubt that faulty drainage, resulting in back pressure and partial retention, favours the development of stone. Mechanical obstruction acts probably in two ways: (1) by the retention of small concrements within the urinary tract, (2) by increasing the supply of stone-forming substance in the retained pool of urine. The preponderance of calculi in the lower calyx may be explained in this way. Increased susceptibility to infection under these conditions is also to be noted.

The relation of infection to calculus formation has already been pointed out. It undoubtedly has much to do with the growth, structure and composition of stones. The reaction of the urine (in terms of pH) may be altered and its colloidal content increased so that a minute concrement may grow rapidly by the deposit of crystalline material of an entirely different composition. In this manner successive layers are deposited, differing with the reaction of the urine, and giving to the body its lamellated structure. In the presence of a calculus, infection is almost sure to occur, sooner or later, and the course of the disease is markedly altered and becomes rapidly progressive. On the other hand it is also a matter of common knowledge, that massive infection of the urinary tract may persist for long periods without any tendency whatever to the formation of stone. This observation would seem to support the idea of specific irreversible stone-forming colloids.

Much has been written concerning diet as a factor in the production of stone. Overeating and sedentary life are often said to be important factors but they are doubtful causes because stone is more common in the poor who live mostly on the monotonous carbohydrate diet like rice. The view is reflected generally in the practice of limiting articles of diet rich in purins, calcium, oxalic acid, and phosphates in the treatment of this condition. It has been found impossible experimentally to increase the amount of these substances in the urine by feeding experiments. There is no direct evidence that diet plays an important role. The fact that the inorganic materials of the food do not accumulate in excess in the urine has been interpreted as one of the defence mechanisms of the body against stone formation.

It has recently been advanced that urinary lithiasis is a deficiency disease rather than the result of excesses in the diet. McCarrison's experimental work on animals points to the same conclusion. Deficiency of vitamin A seems to be responsible for the formation of calculi. It is of interest to note that deficiency of vitamin A leads to alkalinity of urine because vitamin A is derived from acid-ash-producing foods (*e.g.*, fats). If the urine is alkaline it will lead to decomposition of calcium phosphate crystals, also to urinary infection and finally stone formation. Another view held is that serious injury is sustained by the renal epithelium due to the deficiency of vitamin A and it is possible that desquamated epithelium forms the nidus around which stone is deposited. Researches of C. C. Higgins (Ohio) have proved that when rats are maintained on a diet containing no vitamin A, vesical calculus develops in 86-92 per cent. and renal calculus in 34-42 per cent. of the animals in 200-240 days. The calculi produced are composed of calcium and magnesium phosphates and carbonates. Ten to twelve days after the starting of deficiency diet the reaction of the urine becomes alkaline (pH 7·8-8) thus making possible the precipitation of phosphates and carbonates. When rats are maintained on high alkaline ash-diet (carbohydrate) which contains an adequate amount of vitamin A, the formation of calculi does not occur. Similarly, Higgins was able to produce vesical calculus in 5 out of 7 dogs by keeping them on a diet deficient in vitamin A for 7½ months. Those stones were composed of calcium ammonium phosphates and carbonates with traces of oxalates. Uric acid calculi also developed in chickens kept on deficiency diet. When vitamin A alone is restored to the diet of the rats in which stones have been demonstrated by x-ray, the stones dissolve and disappear in course of time. But if renal function is impaired and infection is present, a longer time is required for the stone to disappear.

There also seems to be some relationship between climatic conditions and the calculus disease. Urinary calculus is more prevalent in India, Arabia, Mesopotamia and S. China. The full-blooded Eskimo is immune to stone. Among people residing in districts where soil is sandy, rainfall scanty, and climate hot and dry stone formation is common. The exact causation is unknown but probably excessive perspiration leading to high concentration of urine may have a bearing.

Heredity plays a certain part in the production of urinary calculus, especially cystin and uric acid stone. I know of a family in which members of 3 generations had stone in the bladder.

Stone in urinary tract is twice as common in males as in females.

In kidney it is the same in both sexes. In ureter, male: female = 2:1. In bladder, male: female = 11:1. My own statistics worked out on the cases at Sir Ganga Ram Hospital, Lahore, also correspond to these. It is evident therefore that there is a remarkable diminution in the relative incidence in stone in the women as we pass down the urinary tract. The most common situation of urinary stone in women is the kidney.

Hyperparathyroidism which results from excessive parathyroid secretion due to adenoma and causes osteitis fibrosa cystica and in which (serum calcium is high and serum phosphorus is low) calcium salts are dissolved out of the bones and are excreted *via* urinary tract, leads to the formation of stones which are generally bilateral. The patient is said to be passing his skeleton in the urine. Prolonged immobilisation which leads to skeletal decalcification is another cause of passing skeleton in urine which predisposes to stone formation mainly of calcium phosphates.

Examination of the Urine

Reaction may be acid or alkaline. It may vary in the same case at different times.

Bacteriology—Sterile in 11·7 per cent. Infected in 88·3 per cent.

Out of these:—

Staphylococcus albus	...	50 per cent.
B. coli ...	...	24·1 ,,
Streptococcus ...	...	13·8 ,,
B. proteus ...	...	12·2 ,,
Staphylococcus aureus		Very rare.

More than one variety of organisms may be found in the same specimen. An association of B. proteus or B. pyocyaneus with B. coli is always suggestive of some gross infection which tends to disappear rapidly after the stone has been removed. That staphylococcus albus is the normal inhabitant of the urethra should be borne in mind.

Microscopic Examination—The most important finding is the presence of leucocytes, red blood corpuscles, crystals and excess of epithelial cells. Pus or leucocytes are present in the urine in 89·5 per cent cases. In 11 per cent. of cases in which pus was present the urine was found to be sterile. We must remember therefore that although sterile urine is suggestive of tuberculosis of the kidney it may be found also in cases of urinary calculus.

Red blood corpuscles, too, are found very frequently, more so perhaps than is generally recognized. In a suspected case of stone in the urinary tract its presence is significant, particularly if W. B. C. are found in the same specimen. The number of cells need not be large. Blood or red blood corpuscle is present in urine of stone cases in 73 per cent. and crystals in 33 per cent.

Renal Calculus

Varieties—(a) Calcium oxalate known as mulberry or hedge-hog stone, is covered with sharp projections and these cause the kidney to bleed and altered blood is precipitated on to the surface of the stone. They cast a very good shadow. By virtue of their spiked nature, they give rise to symptoms when comparatively small.

(b) Phosphatic calculi are smooth and dirty white. In alkaline urine they enlarge rapidly and often fill the renal calyces taking on their shape (branching). Because of their smoothness they give rise to few symptoms until they have attained a large size. They are also demonstrated easily by x-ray.

(c) Uratic calculi consist of uric acid and urates. They are hard, smooth, multiple and faceted. Their colour varies from yellow to reddish brown. Pure uric acid calculi do not cast a shadow under x-ray, but the majority of these contain enough calcium oxalate crystals to render them opaque.

(d) Stones composed entirely of bacteria are not uncommon. They are soft and multiple.

(e) Cystin calculi are indeed rare in this country. They cast a good shadow because of their sulphur content. They occur in people suffering from cystinuria—an inborn error of metbolism, xanthin and indigo stones are rare.

Clinical features—Some stones, especially phosphatic ones lie dormant for a long time. Progressive destruction of the kidney substance is inevitable and secondary infection occurs in most cases. The stone may be passed. The cardinal symptoms are (1) pain, and (2) hæmaturia.

Pain is the leading symptom in 75 per cent. of cases and may be (a) fixed renal pain—this is located in the renal angle posteriorly or in the hypochondrium anteriorly and is worse on movement, the patient being unable to sleep on the diseased side; (b) renal colic—attacks of renal colic passing from loin to groin and testicles are typical and it may culminate in strangury; (c) referred pain which may either be referred to the bladder, causing (urgent and frequent micturition) or to the corresponding testicle which is retracted and tender or it may go to the sole of the foot, the heel or the thigh of the corresponding side or it may even be referred to the contra-lateral healthy organ (reno-renal reflex). The pain in the small of the back may occur.

Hæmaturia—About 50 per cent. of cases of renal calculus exhibit this symptom but R. B. C. may be discovered microscopically in nearly all the cases when blood is not apparent to the naked eye. It usually occurs in small quantities after an attack of pain. Pyuria and albuminuria are also frequently present.

Diagnosis—Urography—The demonstration of the lumina of the urinary tract is obtained by the use of contrast media which may be either used (1) locally as a ureteric opaque bougie or by injection of 15% sodium iodide solution through a ureteric catheter etc., (2) by intravenous injection of a contrast

medium as uroselectan B. or per abrodil or by oral administration of sodium iodoorthohippurate (Hippuran) useful especially in children.

X-ray—Before examination, the bowels are cleared by giving a vegetable purgative or pulv. glycerhizæ co. 2 drachms overnight, to be followed by an enema in the morning. Mineral purgatives are avoided because they cast a shadow. Half an hour before the actual urography ½ to 1 c.c. of pitressin or (Leuizyme tablets by mouth) is injected so as to expel flatus from the bowel and thus avoid overlapping of shadows. Both kidneys, their ureters and bladder must be visualized in every case. If a shadow is cast which may be calculus in the kidney or ureter, the diagnosis is settled by re-examination after the passage of an opaque ureteric catheter or by pyelography.

The following may stimulate the shadow of a possible renal calculus: (1) calcareous lumbar or mesenteric glands, (2) a concretion in the appendix, (3) drugs in the alimentary tract, *e.g.*, bismuth, (4) phleboliths, (5) the ossified tip of 12th rib or external arcuate ligament, (6) a chip fracture of the transverse process of a lumbar vertebra on one or both sides, (8) gall stones—to exclude which a lateral skiagram is needed. The gall stones throw a shadow in front of the vertebral column while kidney stones cast a shadow on or behind the vertebral column. The usual location for a renal calculus is opposite the transverse process of the second lumbar vertebra (pelvis) of the kidney.

Treatment—Prophylactic—In view of the Higgins experiments a dietary regimen may be prescribed to patients suffering from urinary calculi but the treatment is successful only in a certain group of patients.

To prevent stone formation in a patient the treatment should be on the following lines:—

(1) Regulation of the pH of the urine by dietetic measures.

(2) Control of infection.

Determination of the pH of the urine by taking a specimen from the kidney with calculus by ureteric catheter and this should be checked at intervals during the treatment.

If any infection is present in the kidney the causal organism should be determined and it should be further ascertained whether it possesses the power of splitting urea. Urea is split into ammonia and CO_2 with the resultant formation of ammonium carbonate which on combining with magnesium phosphate forms ammonium magnesium phosphate which is insoluble and also by rendering the urine alkaline results in precipitation of equally insoluble earthy phosphates. 18 per cent. of the bacilli which infect the urinary tract and 40 per cent. of the strains of staphylococcus albus have the property of splitting urea. If a calculus has been passed spontaneously or has been removed surgically its chemical constituents should be determined to ascertain if the salts are those which are precipitated in an acid or alkaline urine.

By alteration in proportion of carbohydrates, proteins and fats the desired pH is obtained. The patient is taught to find the pH of his urine so that he should do it every day. In order to prevent recurrence of phosphates the pH of the urine must be shifted to below 6·9 (the neutral point, below that it is acid and above that it is alkaline) after the removal of the calculus so that phosphates and carbohydrates are held in complete solution—pH 5·2 is quite satisfactory.

In order to prevent the formation of calculi in patients who pass small stones at frequent intervals but in whom a calculus is not demonstrable in either kidney radiographically, a careful examination of the pH of the urine should be made and chemical constituents of the calculi which have been passed previously determined. If the calculi show that they are composed chiefly of calcium and magnesium phosphates and carbonates, the high vitamin A and acid ash diet (fats) are to be prescribed; when chemical constituents of the stones are uric acid, cystin or oxalates a high vitamin A and alkaline ash diet (carbohydrates) are prescribed.

Cases in which calculi are associated with a marked infection due to B proteus continue to pass calculi and neither the use of ketogenic diet (fats) nor oral medication is sufficient to eradicate the infection or shift the pH of the urine to the acid side. Cases of calculi in the pelvis or calyx of the kidney in which there is no obstruction to the flow of urine, can be treated by dietetic regimen (by Higgins, Ohio).

Higgins collected a series of 32 cases in which a calculus was too large to pass spontaneously or was

so located that its passage through the ureter and renal pelvis was impossible—spontaneous dissolution occurred following dietetic treatment in every case. If the urine obtained by ureteric catheter was alkaline (28 out of 32 cases) and acid-ash diet (fats) was employed. In others the alkaline ash-diet (carbohydrates) was used.

In some cases even with careful dieting no change occurred in the size of the calculus. Why so is not known. In these cases lavaging the renal pelvis with 1% solution of phosphoric acid is recommended by Rendall.

Palliative—During renal colic the patient is given morphia and atropine in full dose and a hot water bottle is applied to the loin. Bland fluids are imbibed freely and subsequently urinary antiseptics administered to prevent infection.

Operative—As soon as the diagnosis of a renal calculus is established and the other kidney is proved to be functioning satisfactorily or rather when total urinary function is within the normal limits, the stone should be removed unless there is some definite contra-indication to operation. The kidney is approached by the usual loin incision and delivered. If the stone is in the pelvis, this should be removed by incising the pelvis posteriorly rather than by traversing the parenchyma. The wound in the pelvis is closed by interrupted sutures and a small catheter is inserted through the lowest calyx to drain the pelvis.

If the stone is in the kidney substance, it is located with a round-bodied needle which, when introduced, feels to grate on it. A small incision is made over the stone which is extracted. It is bad surgery to incise the whole kidney along Brodel's line as was done some years ago, for, bi-section mutilates the kidney and causes serious postoperative hæmorrhage. After the removal of stone, the wound in the kidney is sutured with fine catgut and reinforced with a piece of fascia or fat. A drain is provided into the perinephric tissues and the wound closed up.

It should be remembered that the modern conception of treatment of the urinary lithiasis is not only to remove the stones but also to rid the patient of the super-imposed infection, if any. Hence before discharging the patient bacteriological examination of the urine should be made and if any evidence of infection be present, measures should be adopted to make the urine sterile.

Complications—(1) Stone may pass into the ureter, bladder, urethra and finally out. (2) It may get arrested in the ureter and cause hydro- or pyonephrosis, or calculus anuria may occur. (3) Infection of the pelvis or kidney substance may lead to pyelitis or pylonephritis; perinephric abscess may also occur.

There is a good deal of evidence to show that tuberculous infection of the kidney after calculus formation is much less common than a super-imposition of the stone in a kidney which is already riddled with tuberculosis.

Calculus anuria—In this condition, there is absence of secretion of urine. This should be suspected when a patient has passed no urine for a considerable time and yet signs of distended bladder are wanting. This should be confirmed by passing a catheter.

The causes are:

(1) Both ureters become blocked with stones.

(2) A calculus becomes impacted in a ureter of a single existing kidney.

(3) A stone blocking one ureter and reflex anuria of a contra-lateral organ (rare).

Signs and symptoms—(1) Period of tolerance—the patient passes no urine but remains in fairly good condition and may not feel any pain even up to 4-6 days. This is followed by uræmic convulsions and coma which may come on suddenly. This is an urgent condition and should be promptly dealt with. An immediate x-ray is useful, although in such cases gaseous distention often obscures the stone shadows. Cystoscopic examination may help—a stone may be found impacted in a ureteric orifice or œdema and hæmorrhagic exudate on one side may indicate the side requiring immediate relief.

If stones are located in the pelvis of each kidney immediate operation is indicated on the side in which the patient last experienced pain, because this is the kidney which is likely to be more active. Nephrostomy is performed and a De Pezzer's catheter is inserted into the pelvis, after removing accessible stones. Intravenous saline or 20 per cent.

sodium sulphate should be given (these are the best diuretics) and if possible, blood transfusion should be arranged and given by drip method, because occasionally hæmorrhage from the incised œdematous kidney is excessive.

URETERIC CALCULUS

A ureteric stone usually has its birth in the kidney and in 90 per cent. of cases it is single. It is frequently elongated.

Clinical features—When a stone descends into the ureter it is accompanied by renal colic. This is repeated at longer or shorter intervals until a stone is ejected into the bladder or gets impacted in the ureter. In the event of impaction the stone is arrested at one of the three anatomical constrictions, *viz.*, (1) at the outlet of renal pelvis, (2) at the brim of bony pelvis or (3) at the entrance of the ureter into the bladder. The diagnosis is confirmed by x-ray or by an opaque ureteric bougie.

Treatment—(a) Expectant—If a calculus is shown by x-ray to be small and is attended with attacks of renal colic, the stone may pass on into the bladder. Copious draughts of bland fluids are given along with urinary antiseptics and antispasmodics. The treatment is controlled by radiography.

Papaverine, an antispasmodic, is introduced into the ureter to dislodge the stone. It acts as a local analgesic and lessens the tone of the smooth muscle.

(b) Instrumental—The pasage of a ureteric bougie is sometimes attended by expulsion of stone. The ureteric orifice is dilated and stone seized with special forceps and extracted.

(c) Operative treatment is carried out when (i) the expectant and instrumental treatments have failed, (ii) when the stone looks too large to pass naturally, (iii) when the stone has become impacted. There should not be undue delay in removing a ureteral calculus which is not passing onward and specially if an intravenous pyelogram shows that kidney is dilated. In such cases infection of the kidney seriously jeopardises the convalscence of the patient. The usual extraperitoneal route is chosen for the removal of a ureteral calculus.

VESICAL CALCULUS

Stone in the bladder has been recognized for many centuries as one of the most painful and distressing conditions that can afflict mankind.

Symptoms—There is pain in practically all cases which usually occurs at the end of the act of micturition. It may be burning, pricking or scalding and is referred to the tip or glans, to the base of the penis at its attachment to the perineum. In the female it is usually referred to the vulva. It may also be referred to the perineum and sometimes to the hypogastrium. In a few cases it radiates to the rectum and gives rise to tenesmus.

Between the acts of micturition the pain is usually absent so long as the patient is at rest except in few cases in which the pain is present even on lying down. Walking, jolting, riding or cycling gives rise to great pain.

Speaking generally, a vesical calculus in children nearly always gives rise to severe pain which radiates to the rectum and causes tenesmus and prolapse of the anus.

Somebody has aptly remarked about stone in the bladder that small stones like small dogs make more noise.

A consideration of the surface of the various types of calculi would lead one to suppose that the spiky oxalate stone always gives rise to great pain, far more than the other varieties whose surface is comparatively smooth, but this is not so: Sir Benjamin Brodie considered that the various calculi should be placed in the following order, as regards the pain they cause: Uric acid the least, oxalate probably more, then the calculus composed of triple phosphates gives the most pain. Occasional sudden interruption of the stream during the act of micturition is not uncommon, and is invariably accompanied by a certain amount of pain. Some patients have recourse to various unusual positions during the act of micturition in order to overcome the difficulty, some lie down, and others go on their hands and knees.

Hæmaturia is often small in amount and passed at the end of micturition although it is occasionally seen at the beginning of the act. It is usually dependent on exercise and jolting. When stone is associated with enlarged prostate the bleeding may be profuse. Even if no visible blood is passed in urine red blood corpuscles are invariably found on microscopic examination.

Pain, frequency of micturition and hæmaturia are all aggravated by exercise or jolting and this used

to be consideded as one of the most important points in the preliminary diagnosis.

Exercise may cause pain independently of micturition in the region of the glans penis, along the whole length of the urethra, in the perineum and even in the rectum. In cases of very sensitive bladder any movement of the body causes pain and some patients cannot even go up or downstairs without discomfort. The effect of severe jolting may last for many hours. It is characteristic of the condition that although many patients have great frequency during the day while they are up and about, they are only disturbed once or twice at night.

Diagnosis—In earlier days diagnosis was based on clinical evidence and confirmed by the sound. If a stone is lying in a post-prostatic pouch sounding for a stone is difficult. Small stones, or stones covered with mucus and lying in a diverticulum are often missed by the sound. To-day the sound as a means of diagnosis is almost obsolete and owing to the development of radiography and cystoscopy the presence or absence of a vesical calculus in any given case can be determined with extreme accuracy. But it should be remembered that uric acid stones throw no shadow, and that certain other stones throw such a faint shadow that it can be recognized only with difficulty against back-ground of the sacrum and may be overlooked. Opaque bodies lying outside the bladder may be mistaken for stones *e.g.*, caseous tuberculous masses in tuberculous peritonitis. Another source of difficulty in exact diagnosis is a stone lying in a prolapsed ureter. Cystoscopy cannot reveal a stone hidden in a diverticulum.

Treatment—Before the advent of lithotrity the perineal operation was practised universally and was known as lateral lithotomy because the approach to the bladder used to be made lateral to the middle line of the perineum by the side of the prostate. This route was chosen probably because there are no important structures or blood vessels encountered on the way and there is chance of peritoneal infection by the suprapubic route.

A small calculus may be removed by means of a cannula and aspirator as used in litholapaxy. The operations which are performed for stone in the bladder are of two kinds:—(1) Crushing—litholapaxy or lithotrity and (2) Cutting—lithotomy.

Litholapaxy or Lithotrity:—Crushing the stone by a lithotrite and removing the fragments at one sitting by a cannula and an aspirator was introduced by Bigelow of Boston in 1878 and it is now the operation of choice. The operation lasts from 20 minutes to an hour or more according to the size of the stone and the condition of the bladder.

There are theoretical objections against the performance of litholapaxy in children. The urethra is very small and narrow and its mucous membrane delicate and easily torn, and the bladder is small and pear-shaped so that the space for manipulation is limited. The operation in children takes longer time and there is more danger of leaving fragments behind but this can be avoided by care and experience. Freyer has established the operation of litholapaxy in children on a sound basis. A series of small lithotrites are required. The aspirator is used with great gentleness and only a small quantity of water is passed in the bladder at each systole. The earliest age at which litholapaxy can be performed depends upon the calibre of the urethra. Freyer performed the operation on a male child aged 18 months and Thompson Walker on a boy aged 15 months. The operation presents no difficulty in the female.

Difficulties and Contra-indications of Litholapaxy:—

I. Urethra—(a) External meatus may be too narrow—meatotomy should be performed. (b) In all cases of vesical calculus, the urethra should be examined before operation and a large sound passed to estimate the calibre of the tube. If stricture is present it should be treated beforehand. (c) Spasm of the membranous urethra.

II. Enlarged prostate—A moderate enlargement of the prostate is not a barrier to litholapaxy but a large prostate causes considerable difficulty in the introduction of lithotrite and a well-developed intravesical projection hampers the movement, so that stone wedged behind it is reached with difficulty. Hæmorrhage may be severe. The best method of treatment of stone with enlarged prostate is a suprapubic prostatectomy with removal of stone. There is no difficulty in performing litholapaxy in cases of recurrent stones where prostatectomy has previously been done.

III. The bladder—(a) In acute cystitis the bladder does not hold sufficient fluid to allow litho-

lapaxy being performed. (b) Advanced sacculation of the bladder should be looked upon as a contra-indication to litholapaxy. The fragments of the stone fall into saccules and are not easily sucked by the aspirator. Moreover, the wall of a saccule may rupture. (c) Spasmodic contraction of the bladder around the stone and a stone lying in a saccule are also contra-indications. (d) New growths of the bladder when combined with stone, contra-indicates litholapaxy.

IV. Size of the stone—Too large a stone, too small a stone, too hard a stone (difficult to crush), too soft stone (will jam the blades of lithotrite) are also contra-indications.

Dangers of litholapaxy—Perforation of the bladder which may be extraperitoneal or intraperitoneal and severe hæmorrhage.

Canny Ryall's cystoscopic lithotrite enables the operator to watch the process of crushing the stone in the bladder. But slight bleeding that results makes the picture hazy after 1 or 2 crushes and obliterates the field of vision.

Suprapubic lithotomy—Its indications are when the stone is too big or lying in a diverticulum or stone associated with enlarged prostate or malignant disease of the bladder.

Urethral Calculus

There are two varieties—(1) Primary which originates in the urethra and it is always phosphatic. (2) Secondary, when a migrating calculus is arrested in the canal.

Sometimes these stones grow too big in size, especially at the vesical end. Multiple stones in urethra are due to fracture of a single stone. So far as the site of the stone in the urethra is concerned, prostatic and membranous urethra form 42 per cent., bulb 28 per cent. and fossa navicularis 11 per cent. In the majority of cases one or more strictures of the urethra co-exist. The stone frequently lies behind the strictures or between the two. Unwary fistula may be associated in the perineum. In old patients stone in urethra may be associated with stone in the prostate.

Treatment—Stone may be pushed back in the bladder by a catheter and then evacuated with a canula or removed by crushing. If in fossa navicularis it can be removed by crocodile forceps or by meatotomy. Fixed calculus in prostatic urethra is approached through median perineal section.

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INVESTIGATION ON THE RESULTS OF GADUSAN (COLLOIDAL COPPER MORRHUATE) IN PULMONARY TUBERCULOSIS

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Gadusan is a solution of a new chemical combination of cod-liver oil and copper prepared for injection. It was suggested by Paulo Seabra of the National Academy of Medicine of Rio de Janeiro and is used in the treatment of various forms of tuberculosis; alone, in association with hygienic and dietetic treatment or as an adjuvant of other therapeutic methods such as collapse therapy.

Gadusan is an aqueous product formed by the union of the fatty acids of cod-liver oil in the same proportion in which these acids are found in the oil but combined with copper-forming salts put in the colloidal condition. Gadusan is, therefore, physiohydrosol of copper morrhuate. It is put up as a sterile, isotonized and titrated to 1:1000 solution which renders its administration painless.

Gadusan represents a further advance in the list of drugs already in use for the treatment of tuberculosis. So far the use of various preparations of colloidal calcium and cod-liver oil have been tried but both have their disadvantages in their unpleasant taste and smell and the gastric disturbance which they often bring about.

Gadusan being a combination of a metal and cod-liver oil, has a double advantage of the chemotherapeutical action of copper as well as the roborant action of cod-liver oil.

Further, Gadusan provides the anti-anæmic action of copper. A valuable auxiliary in the treatment of anæmia is certainly copper which has also got a selective action on Koch's bacilli. Thus Gadusan contains all the known therapeutic remedies which may be confidently administered to human beings on account of their innocuous nature.

The treatment by way of intravenous injections of Gadusan was given a trial for a period extending over six months at the Maratha Tuberculosis Hospital, Bombay.

During the investigation several unforeseen and incidental difficulties were experienced. A large percentage of the inmates of the hospital were very advanced cases and could not be selected for the course of Gadusan treatment as their chances of surviving long enough were precarious. Even patients selected after considerable scrutiny of their general condition left a part of their treatment with Gadusan incomplete and left the hospital although some amelioration of their clinical symptoms was noticeable. In several of our cases an intimation was given to the patient on his leaving the hospital to come on fixed days and receive his Gadusan treatment. It is worth noting that none of the patients cared to take advantage of the offer in spite of some benefit the Gadusan treatment had given them during their stay in the hospital. This strange indifference can be easily understood when we consider the ignorance and poverty of the classes from which the in-patients in a public hospital in this country are mostly recruited.

For this investigation, it was decided to select four groups of patients suffering from pulmonary tuberculosis as under:—

Group A is composed of 15 cases who had already received or were receiving artificial pneumothorax treatment. Of these one case No. 641 had phrenicotomy performed, after several refills.

Group B is composed of 8 cases who had already received or had been receiving artificial pneumothorax treatment. Of these one case No. 4 had phrenicotomy performed after several refills and 2 cases Nos. 990 and 999 who had not received artificial pneumothorax treatment, but had phrenicotomy performed.

The Group B received Gadusan treatment during the investigation. The results obtained are appended *vide* Tables I & II.

The Group C is composed of 13 cases who had neither artificial pneumothorax treatment nor phrenicotomy performed. They were receiving the benefits of the usual hygienic and dietetic treatment employed in the hopital.

The Group D is composed of 4 cases who were identical in all respects with those included in Group C, but were treated with a course of Gadusan injections during this investigation. The results obtained are appended *vide* Tables III & IV.

The beneficial effects of Gadusan on the tuberculous patients under investigation are noticeable in the following directions:

(i) General feeling of well-being on the part of the patient.

(ii) Improvement in the appetite.

(iii) Maintenance of the original weight with an increase in weight in some cases.

(iv) General improvement in the clinical picture as evidenced by (a) lowering of temperature, and (b) diminished bronchial irritation.

(v) It will prove as a help in the improvement of the general condition of the patient along with the treatment by collapse therapy which controls the disease.

Full Vegetarian Diet in vogue at the Maratha Tuberculosis Hospital, Bombay.

6 a.m. 6 ozs. of tea with milk and sugar.
5 ozs. bread.
1 oz. butter.
1 egg.

9 a.m. Vegetable soup 6 ozs.

11 a.m. Chapaties (Wholemeal bread made of wheat flour).
Cooked vegetables.
Cooked cereals.
Boiled rice.

N. B. A generous helping of each is supplied.

2 p.m. 6 ozs. of tea with milk and sugar.
5 ozs. bread.
1 oz. butter.

6 p.m. Chapaties
Cooked vegetables.
Cooked cereals.
Boiled rice.
6 ozs. milk.

N. B. A generous helping is supplied.

9 p.m. 6 ozs. of coffee with milk and sugar, or 6 ozs. of milk.

Extras. Two bananas twice a week.

Full Non-Vegetarian Diet in vogue in the Maratha Tuberculosis Hospital, Bombay.

6 a.m. 6 ozs. of tea with milk and sugar.
3 ozs. bread.
1 oz. butter.
One egg.

9 a.m. 6 ozs. liver soup.

11 a.m. 6 ozs. bread.
Cooked vegetables.
A course of mutton.
Boiled rice.

2 p.m. 6 ozs. of tea with milk and sugar.
3 ozs. bread.
1 oz. butter.

6 p.m. 6 ozs. bread.
6 ozs. milk.
Vegetables.
A course of mutton.
Boiled rice.

9 p.m. 6 ozs. of coffee with milk and sugar, or 6 ozs. of milk.

Extras. Two bananas twice a week.

TABLE No. I. GROUP A.

No.	Age	Sex	Date of A. P.	No. of refills	Weight in pounds		No. of Injections	Results	Improvement	Complications.
					before	after				
1.	17	M	30-7-37	3	88	88	Nil	Same	Nil	Diarrhœa. Hæmoptysis.
2.	35	F	18-8-37	2	69	68	Nil	Same	Nil	Hæmoptysis.
3.	23	M	12-8-37	6	100	93	Nil	Same	Nil	Hæmoptysis.
4.	25	M	10-9-37	3	88	88	Nil	Relieved	Nil	Diarrhœa.
5.	33	M	22-6-37	4	83	82	Nil	Same	Nil	Hæmoptysis.
6.	27	M	20-5-37	7	84	81	Nil	Same	Nil	Hæmoptysis. Anæmia.
7.	26	M	22-7-37	3	89	89	Nil	Same	Nil	Diarrhœa.
8.	25	M	25-8-37	3	98	86	Nil	Died	Nil	Hæmoptysis.
9.	40	F	24-9-37	2	86	86	Nil	Same	Nil	Diarrhœa.
10.	22	M	9-8-37	5	82	82	Nil	Same	Nil	Diarrhœa.
11.	22	M	28-6-37	3	95	82	Nil	Same	Nil	Diarrhœa.
12.	35	F	A.P.11-7-37 P.H.11-8-37	Nil	89	81	Nil	Same	Nil	Hæmoptysis. Anæmia.
13.	45	M	17-3-38	4	83	80	Nil	Same	Nil	Hæmoptysis. Anæmia.
14.	24	M	18-4-38	3	100	97	Nil	Same	Nil	Diarrhœa.
15.	25	M	9-7-37	2	80	80	Nil	Same	Nil	Diarrhœa.

A. P. = Artificial Pneumothorax. P. H. = Phrenicotomy.

TABLE No. II. GROUP B.

No.	Age	Sex	Date of A. P.	No. of refills	Weight in pounds		No. of Injections	Results	Improvement	Complications.
					before	after				
1.	45	M	5-11-37	3	101	100	13	Improved	Appetite improved. General health better. Anæmia.	Nil
2.	23	M	27- 9-37	7	90	79	14	Relieved	Appetite improved Anæmia.	Nil
3.	25	M	A.P.13-1-38 P.H.27-2-38	3	105	107	20	Improved	Appetite better. General health improved.	Nil
4.	38	M	7- 3-38	5	107	109	18	Cured	Appetite good General health improved. Anæmia.	Nil
5.	30	M	9- 3-38	3	87	81	19	Same	General health better.	Nil
6.	19	F	3- 2-38	3	82	80	15	Relieved	Appetite better	Nil
7.	18	F	18-12-37	5	84	85	31	Improved	Appetite better General health improved. Anæmia.	Nil
8.	24	F	12- 3-38	5	81	82	20	Improved	Appetite better General condition improved. Anæmia.	Nil
9.	22	M	P.H.18-11-37	Nil	97	96	20	Improved	Appetite better General condition improved. Anæmia.	Nil
10.	14	M	P.H.18-11-37	Nil	85	88	20	Improved	Appetite better General condition improved. Anæmia.	Nil

A. P. = Artificial Pneumothorax. P. H. = Phrenicotomy.

TABLE No. III. GROUP C.

No.	Age	Sex	H & D	Weight in pounds		Injections	Results	Improvement	Complications.
				before	after				
1.	17	M	H & D	75	67	Nil	Bad	Nil	General Weakness.
2.	35	F	,,	70	52	Nil	Bad	Nil	Anæmia. Diarrhœa. General weakness.
3.	22	M	,,	83	70	Nil	Bad	Nil	Hæmoptysis.
4.	27	M	,,	79	68	Nil	Died	Nil	General weakness.
5.	18	M	,,	90	80	Nil	Died	Nil	Hæmoptysis. Emaciation. Anæmia.
6.	40	M	,,	103	83	Nil	Bad	Nil	Severe hæmoptysis.
7.	18	F	,,	85	82	Nil	Died	Nil	Hæmoptysis. Weakness.
8.	20	M	,,	68	59	Nil	Died	Nil	Weakness.
9.	25	F	,,	80	70	Nil	Died	Nil	Anæmia. Hæmoptysis.
10.	36	M	,,	86	84	Nil	Same	Nil	Hæmoptysis.
11.	20	M	,,	80	76	Nil	Died	Nil	Hæmoptysis.
12.	40	M	,,	90	83	Nil	Bad	Nil	Loss of weight. Hæmoptysis. Anæmia.
13.	35	F	,,	95	92	Nil	Died	Nil	Hæmoptysis.

H = Hygiene Treatment, D = Dietetic Treatment.

TABLE No. IV. GROUP D.

No.	Age	Sex	H & D	Weight in pounds		Injections	Results	Improvement	Complications
				before	after				
1.	16	F	H & D & Gadusan Injections	63	66	14	Improved	Appetite better. General condition improved. Anæmia.	Slight hæmoptysis.
2.	19	F	,,	80	68	25	Bad	Appetite bad.	Slight hæmoptysis.
3.	15	M	,,	75	75	15	Improved	Weight constant. Appetite better General condition improved.	Nil
4.	25	F	,,	74	68	11	Died	Nil	Nil

H = Hygienic Treatment. D = Dietetic Treatment.

STUDIES ON THE FORMATION OF CLOSTRIDIUM TETANI TOXIN

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Although the usual procedure in any routine production of Clostridium tetani toxin is to filter the broth culture within 8 to 14 days (*cf.* Wadsworth, 1927; System of Bacteriology, 1929), it is being often noticed in this laboratory that the potency of the toxin obtained therefrom, is seldom uniform. Of course, any definite knowledge of factors concerning the formation of toxin is still lacking, but it may, for reasons unknown, so happen that the toxin may even increase in potency within a much shorter period and then for its unstable nature might gradually lose its potency. It would, therefore, be not unreasonable to expect a better result from the filtrate obtained by filtering the broth culture long before the above scheduled time. In practice too, a higher potency has often been noticed in culture filtrate obtained after 4 days from inoculation than in that obtained after 8 days. Under such circumstances difficulty would invariably arise in ascertaining the period of incubation and fixing the day of filtration of the inoculated broth, particularly in any large scale operation. Consequently, it would be of interest to find out the factors on which the formation of Clostridium tetani toxin depends. Accordingly, an investigation has been undertaken and the nature of nitrogenous substances present in the broth and the subsequent changes of these substances during the incubation period, so far studied, are being recorded in this paper.

Experimental

The broth prepared from minced and fat-free-veal (infused overnight in the ice-chest with equal amount of water) with addition of Witte's peptone (1 per cent.) and sodium chloride (0·5 per cent.) and maintained at pH 7·4 was first of all analysed to find out the amount of nitrogen in the whole broth and its percentages in metaprotein, proteose (together with peotone and diamino acids), amino acids and residual fractions of the broth. The nitrogenous bodies that are precipitated by phosphotungstic acid (5 per cent.) and not by trichloracetic acid (20 per cent.) are being termed here as proteose.

For estimating these nitrogen percentages in the different fractions of the broth, its protein concentration ($N \times 6{\cdot}25$) was lowered down to about 1 per cent. by diluting with water (*cf.* Seibert, 1926). The figures of the nitrogen percentages in the tables attached have, however, been calculated in terms of whole broth.

In all cases, the nitrogen was estimated by Kjeldhal distillation method. The procedure followed was according to the method described by Goswami and Ray (1937). 10 c.c. of the broth was mixed with sulphuric acid, sp. gr. 1·84 (10 c.c.), potassium hydrogen sulphate (5 gm.), crystallised copper sulphate (0·5 gm.), selenium (0·05 gm.) and mercuric oxide (0·1 gm.) and heated in a Kjeldhal flask until clear blue colour is obtained. Nitrogen is then estimated in the customary way. This gives the total nitrogen.

8 c.c. of the diluted broth were taken and were precipitated with 32 c.c. of 20 per cent. trichloracetic acid and after 15 minutes the mixture was filtered through hardened filter paper. 25 c.c. of the clear filtrate was taken for nitrogen estimation. Similarly another sample of 8 c.c. of the diluted broth was treated with 32 c.c. of 5 per cent. phosphotungstic acid (containing 30 c.c. sulphuric acid per litre). 25 c.c. of the filtrate were taken for nitrogen estimation. In both these cases the result gives the nitrogen of the particular fraction in 5 c.c. $(8 \times 25)/40$ of the diluted broth.

The nitrogen in the filtrate of the solution precipitated by phosphotungstic acid is the nitrogen of the monoamino acid and residual fraction. The

TABLE I

Cases Where the Usual Broth Excluding the Dextrose was Used

Nos. of Expt.	Period of incubation in days	Total nitrogen %	Metaprotein nitrogen %	Proteose Nitrogen %	Values of $\sqrt{P.N.}$	Amino acid and residual nitrogen %	m. l. d. per c.c.
1	Initial	0·549	0·085	0·302	0·549	0·162	—
	4	0·549	0·047	0·291	0·539	0·211	6×10^4
	8	0·549	0·027	0·260	0·509	0·262	3×10^4
	12	0·549	0·027	0·260	0·509	0·262	3×10^4
2	Initial	0·534	0·083	0·300	0·547	0·151	—
	4	0·534	0·064	0·287	0·535	0·183	6×10^4
	8	0·534	nil	0·274	0·523	0·260	6×10^4
	12	0·534	nil	0·274	0·523	0·260	5×10^4
3	Initial	0·537	0·073	0·289	0·546	0·175	—
	4	0·537	—	—	—	—	6×10^4
	8	0·537	0·038	0·262	0·511	0·237	4×10^4
	12	0·537	0·038	0·262	0·511	0·237	3×10^4
4	Initial	0·555	0·075	0·335	0·578	0·146	—
	4	0·555	nil	0·311	0·557	0·244	6×10^4
	8	0·555	nil	0·293	0·541	0·262	5×10^4
	12	0·555	nil	0·293	0·541	0·262	3×10^4
5	Initial	0·535	0·072	0·296	0·543	0·167	—
	4	0·535	0·041	0·284	0·532	0·210	6×10^4
	8	0·535	0·032	0·252	0·502	0·251	4×10^4
	12	0·535	0·032	0·252	0·502	0·251	4×10^4
6	Initial	0·541	0·077	0·312	0·558	0·152	—
	4	0·541	0·048	0·289	0·537	0·204	6×10^4
	8	0·541	0·030	0·249	0·499	0·262	5×10^4
	12	0·541	0·030	0·249	0·499	0·262	4×10^4
7	Initial	0·551	0·074	0·323	0·568	0·151	—
	4	0·551	0·053	0·299	0·546	0·199	6×10^4
	8	0·551	0·047	0·275	0·524	0·299	6×10^4
	12	0·551	0·032	0·254	0·504	0·265	4×10^4
8	Initial	0·563	0·081	0·327	0·571	0·155	—
	4	0·563	0·069	0·310	0·556	0·184	6×10^4
	8	0·563	0·047	0·287	0·535	0·229	5×10^4
	12	0·563	0·047	0·287	0·535	0·229	4×10^4
9	Initial	0·589	0·108	0·317	0·563	0·164	—
	4	0·589	0·079	0·256	0·505	0·254	4×10^4
	8	0·589	0·045	0·290	0·538	0·254	5×10^4
	12	0·589	nil	0·336	0·579	0·254	6×10^4
10	Initial	0·545	0·078	0·315	0·561	0·152	—
	4	0·545	nil	0·289	0·537	0·256	6×10^4
	8	0·545	nil	0·269	0·518	0·276	6×10^4
	12	0·545	nil	0·269	0·518	0·276	6×10^4

nitrogen in the filtrate from solution precipitated by trichloracetic acid is the nitrogen of proteose, amino acids and residual and therefore by difference between these two filtrate nitrogen, the proteose nitrogen is obtained. The difference between the nitrogen in the trichloracetic acid filtrate and the total nitrogen is the metaprotein nitrogen.

The technique of production and standardisation of toxin as followed in the present work is as follows:—

Toxin was prepared in cylindrical, amber coloured, narrow mouthed reagent bottles (about 3 litre in capacity) filled up to the neck with broth and plugged with rubber stopper. Each bottle was in-

TABLE II

Cases Where Veal Infusion with Peptone was Initially Digested with Pepsin

Nos. of Expt.	Period of incubation in days	Total nitrogen %	Metaprotein nitrogen %	Proteose Nitrogen %	Values of $\sqrt{P.N.}$	Amino acid and residual nitrogen %	m. l. d. per c.c.
11	Initial	0·506	nil	0·364	0·603	0·142	—
	4	0·506	nil	0·282	0·531	0·224	5×10^4
	8	0·506	nil	0·249	0·499	0·257	6×10^4
	12	0·506	nil	0·249	0·499	0·257	5×10^4
12	Initial	0·531	nil	0·352	0·593	0·179	—
	4	0·531	nil	0·307	0·554	0·224	5×10^4
	8	0·531	nil	0·284	0·532	0·247	6×10^4
	12	0·531	nil	0·284	0·532	0·247	5×10^4
13	Initial	0·490	nil	0·326	0·571	0·164	—
	4	0·490	nil	0·266	0·515	0·224	4×10^4
	8	0·490	nil	0·247	0·497	0·243	5×10^4
	12	0·490	nil	0·237	0·485	0·253	6×10^4
14	Initial	0·430	nil	0·260	0·509	0·170	—
	4	0·430	nil	0·212	0·460	0·218	2×10^4
	8	0·430	nil	0·199	0·446	0·231	3×10^4
	12	0·430	nil	0·186	0·431	0·244	4×10^4
15	Initial	0·537	nil	0·343	0·585	0·194	—
	4	0·537	nil	0·318	0·563	0·219	4×10^4
	8	0·537	nil	0·299	0·546	0·238	5×10^4
	12	0·537	nil	0·287	0·535	0·250	6×10^4
16	Initial	0·521	nil	0·340	0·583	0·181	—
	4	0·521	nil	0·317	0·563	0·204	4×10^4
	8	0·521	nil	0·288	0·536	0·233	4×10^4
	12	0·521	nil	0·266	0·515	0·255	6×10^4
17	Initial	0·529	nil	0·328	0·572	0·201	—
	4	0·529	nil	0·303	0·550	0·226	4×10^4
	8	0·529	nil	0·292	0·540	0·237	5×10^4
	12	0·529	nil	0·277	0·523	0·252	6×10^4

TABLE III

Nos. of Expt.	Initial total nitrogen (A)	Initial value of $\sqrt{P.N.}$ (B)	Numerical difference between (B) & (A)	Period in days for Max. toxin formation	Value of $\sqrt{P.N.}$ during max. toxin formation (C)	Numerical difference bet. (C) & (A)	No. of days for establishment of the relation T. N. = $\sqrt{P.N.}$
1	·549	·549	—	4	·539	−·01	4
2	·534	·547	+·013	4	·535	+·001	4
3	·537	·546	+·009	4	—	—	—
4	·555	·578	+·023	4	·557	+·002	4
5	·535	·543	+·008	4	·532	−·003	4
6	·541	·558	+·017	4	·537	−·004	4
7	·551	·568	+·017	4	·546	−·005	4
8	·563	·571	+·008	4	·556	−·007	4
9	·589	·563	−·026	12	·579	−·01	12
10	·545	·561	+·016	4	·537	−·008	4
11	·506	·603	+·097	8	·499	−·007	8
12	·531	·593	+·062	8	·532	+·001	8
13	·490	·571	+·081	12	·485	−·005	12
14	·430	·509	+·079	12	·431	+·001	12
15	·537	·585	+·048	12	·535	−·002	12
16	·521	·583	+·062	12	·515	−·006	12
17	·529	·572	+·043	12	·526	−·003	12

T. N. = Total nitrogen; P. N. = Proteose nitrogen.

oculated with 10 c.c. of supernatant fluid from two 'cooked meat' culture tubes of 24 hours' growth. Lots of six such bottles containing the same broth were inoculated with same day's subculture to ensure uniformity. The bottles were then shaken well and incubated at 37°C. Two bottles from each lot of six were removed from the incubator after 4, 8 and 12 days respectively from the day of inoculation. These were then tested for purity and then filtered through Seitz under negative pressure. Samples of each lot of filtrate were then taken for chemical and biological assay.

For determination of toxicity, each sample was tested on guinea pigs (about 350 gms.) in dilution of 1:30,000, 1:40,000, 1:50,000 and 1:60,000 in normal saline. 1 c.c. of each dilution was injected subcutaneously in three guinea pigs and results were noted after 96 hours of injection.

Next the veal infusion with Wite's peptone (1 per cent. was digested at 37°C with pepsin (0·2 per cent. adjusted to pH 1·8-1·9 with sulphuric acid until the reaction mixture on dilution (1:4) and on removal of sulphuric acid did not give any precipitate with trichloracetic acid (20 per cent). The digested mixture was freed from acid by treatment with barium hydroxide (powder), mixed with sodium chloride (0·5 per cent.) and finally adjusted to pH 7·4 with normal caustic soda solution. It was then sterilized at 15 lbs. pressure per square inch for 25 minutes. An aliquot part of the broth was taken for chemical analysis and the rest was inoculated with Cl. tetani as usual. The changes on the nature of the various nitrogenous bodies are being recorded in Table II.

Discussion

From the Table I, it may be noticed that the maximum potency of the toxin was obtained after 4 days excluding the case No. 9, whereas in the cases where veal infusion was initially digested with pepsin to hydrolyse all the protein bodies (*vide* Table II) the m.l.d. was highest after 12 days of incubation in most cases and only in two cases (Nos. 11 and 12) after 8 days. These observations point to the fact that the mere absence of protein bodies would not promote the rapid formation of toxin. But it is the relative amount of total nitrogenous bodies and the proteose that seem to play an essential part in its formation. From the Table III, it is apparent that whenever the square root of the percentage of proteose nitrogen equals almost numerically to that of total nitrogen (*vide* column 7, Table III), the maximum amount of toxin as measured by m.l.d. is always obtained or in other words to get the maximum toxin from a broth culture of Cl. tetani, the relation (total nitrogen = $\sqrt{}$proteoe nitrogen, will have to be establsihed.

Clostridium tetani by possessing a proteolytic property might increase the percentage of proteose in the broth culture, but it is a difficult question to decide whether this proteose formation is really responsible for the production of toxin. It may, however, be noted that the initial digestion of the broth by pepsin does not help in the rapid formation of toxin. Of course, the proteolytic hydrolysis of veal broth by the culture may fundamentally differ from that promoted by pepsin digestion. Table III (column 4) further tends to show that whenever the numerical difference of initial value of $\sqrt{P.N.}$ and the initial total nitrogen is not exceedingly high the maximum toxicity of the filtrate is usually obtained after 4 days of incubation or so. This observation might afford a method of ascertaining the period during which the maximum toxin formation would take place. Further work is in progress.

Conclusion

From the number of experiments so far carried out it appears that the square root of proteose nitrogen holds a relationship with the total nitrogen which may be a measure of the period when the maximum toxin formation in any culture broth of Cl. tetani may be expected.

In conclusion, the authors wish to express their sincere thanks to Dr. U. P. Basu, D.SC., P.R.S. for his interest in this work.

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(4) Wadsworth (1927)—Standard Methods (Baillier, Tindall & Co., p. 89).

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PROVINCIAL LANGUAGES FOR TECHNICAL EDUCATION

The importance and urgency of imparting training in technical subjects, particularly medicine, were stressed in a memorandum submitted to the Minister of Health, Bombay (published elsewhere) by some leading teachers of medicine in Bombay. The memorandum is of particular importance because of the intrinsic merits of the scheme elaborated in it, and the high standing of its sponsors. A long experience of teaching medicine enables the signatories to deal with the subject in an authoritative and a comprehensive manner. It is now universally recognised that education to be fruitful must be imparted in the mother tongue of the people. But, the fact that the advantages of employing the mother tongue in the teaching of technical subjects are even greater, has not so far been clearly realised. As a result circumstances which need not be gone into here, the development of the country has been very slow during the past hundred years. Mahatma Gandhi has referred to this in the *Harijan* as follows: "English, having been made the medium of instruction in all the higher branches of learning, has created a permanent bar between the highly educated few and the uneducated many. It has prevented knowledge from percolating to the masses." All the modern technical knowledge has come to us from abroad, and in foreign languages. This has resulted in this knowledge not being assimilated and still being considered alien. In the case of medicine even after a hundred years of the existence of medical colleges, educated people still talk of Eastern and Western medicine or systems of medicine. This clearly implies that medical science has not yet struck root in the country or become Indianised. The effects of this situation are deplorable in a country like India, where preventible diseases still continue to play havoc. In other parts of the world such diseases have been practically wiped out by the willing adoption of health measures by the people themselves. In India such measures continue to be considered as strange and unacceptable. The memorandum forcibly points out that this situation has been brought about by the use of English as the medium in which the education and the practice of medicine are being carried out. The very concepts which the medical men use remain foreign to them and to their patients.

The case made out for the use of provincial languages in the medical institutions is therefore very strong. The special value of the memorandum, however, lies in the clear way in which the difficulties which must be faced and surmounted have been pointed out, and the new idea of the creation of medical academies as a first stage towards the creation of teaching universities in the province has been worked out in the scheme.

We are glad that an important educational step which has been long overdue, has now been put forward in a comprehensive manner, and it should be the proud privilege of Congress Governments in the Provinces, to give early effect to these proposals.

NATIONAL PLANNING

PUBLIC HEALTH SUB-COMMITTEE

The announcement of the personnel of the Public Health Sub-committee of the National Planning Committee has been received with satisfaction throughout the country. It is regrettable that Col. Chopra was unable to accept the chairmanship of the Sub-committee. It is, however, fortunate that there are others amongst the members who can perform this difficult task with ability and distinction, and it is gratifying to know that Dr. Jivraj Mehta has agreed to serve as secretary.

STANDARDS OF DIETARY AND NUTRITION

The purview of the Sub-committee is an ambitious one and it includes all the important subjects comprising Public Health and Medical Relief. In a country which suffers from a chronic form of nutritional deficiency, it is fit and proper that the first place has been accorded to dietary and nutrition. Important spade work on this subject has already been carried out under the auspices of the Bombay Presidency Baby and Health Week Association and a cheap well-balanced diet has been evolved.[1]

It was emphasized that fresh whole milk formed an important part of a well-balanced diet. It is necessary, therefore, to provide milk for the masses at a price which they can afford. An enquiry by Dr. K. S. Mhaskar showed that the monthly food expenses of poor class families in Bombay vary from Rs. 4/- to Rs. 5/8/- but in composition their diet is unbalanced.

INFANTILE AND MATERNAL MORTALITY

It is a deplorable fact that no civilised country has ever had a higher rate of infantile mortality than we have in India. The Public Health Commissioner for India records it as 157 for rural and 211·6 for the urban areas for every 1000 live births in 1936.[2] A recent statistical enquiry into maternal mortality in Bombay by Dr. Miss Jhirad of the Cama Hospital, is worthy of careful notice. It is nothing less than a tragedy that puerperal sepsis accounted for 39·11 per cent. of cases of maternal mortality.[3] Bombay has an excellent net-work of maternity institutions of various types providing a total of 1289 beds for a population of 1·1 millions (1 bed to 900). According to the report of the Health Officer of Bombay City, 75·74 per cent. births occurred in these institutions. It appears that 28·8 per cent. of maternal deaths occurred in home deliveries. We need not go into further details for conditions are no better in other parts of the country. It is of national importance that the present deplorable state of affairs should be rectified without further delay.

OTHER IMPORTANT ITEMS

The Public Health Sub-committee will deal with other important subjects such as health insurance, medical training and research and compilation of vital statistics. The provision of necessary health units entails many difficulties of organisation and finance, particularly in rural areas. In a poor country like India it is of great imperative that every means should be taken to prevent the drain of capital. Patronage of Indian medicinal products should necessarily come first but cultivation of important medicinal plants and the manufacture of specific remedies can brook no further delay. We are afraid that the Public Health Sub-committee is faced with a tremendous task, but we have every confidence that their efforts will be crowned with success.

THE ROLE OF THE MEDICAL PROFESSION

The role of the medical profession in National Planning was discussed by Dr. B. C. Roy in a recent address delivered under the auspices of the Bombay Medical Association at the G. S. Medical College.[4] The medical man, he said, was not pursuing a trade or business but a profession, and a noble one at that. He has far more opportunities and facilities for national development because of his intimate association with individuals and families who constitute the nation. For that reason he has a great responsibility and duty to the community and for the development of the nation. His services are more essential than those of any other section of the community. The ideal of the medical man is one of service and sacrifice for the whole country.

1. Bombay Presidency Baby and Health Week Association. Pamphlet No. 8.

2. Annual Report. Public Health Commissioner, Government of India, 1936, Vol. I (Manager of Publications, Delhi).

3. Report of the Scientific Advisory Board (1938) Ind. Res. Fund Assn., New Delhi.

4. The Times of India, 27-8-39.

CASE NOTES

A CASE OF FRACTURED PATELLA OF FOUR MONTHS' DURATION TREATED BY TOTAL EXCISION OF THE BROKEN FRAGMENTS

R. M. NADKARNI, M.B., B.S.,
Hyderabad-Deccan

Mr. R. N. M. aged 43, a lecturer in a Government College, was seen by me within an hour of his having fractured his left patella. While descending a staircase his leg slipped and on trying to control the balance he felt a snap at the knee and fell down from a height of two feet. It was a case of

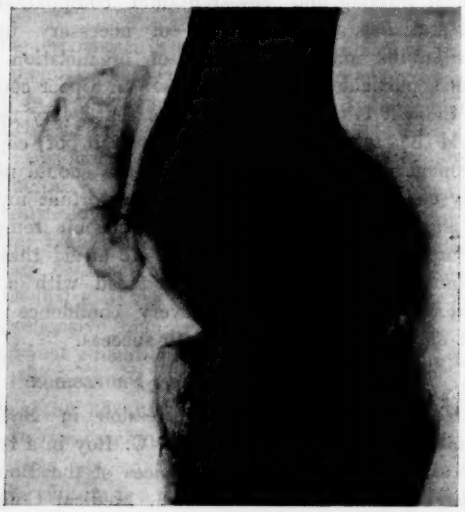

Fig. 1—Showing non-union of Fractured Patella.

fracture by muscular violence. Operative treatment was advised by me but it was not carried out by the patient.

Four months later I saw him again with his left lower extremity straight and stiff at the knee. Passive flexion movement was limited to the extent of 5 to 7 degrees. On skiagraphy, the non-union was quite clear.

I decided to excise the broken pieces of patella and repair the aponeurosis, under Evipan-Sodium and supplemented with chloroform anæsthesia. A tourniquet was applied round the thigh. The broken patella was exposed by a straight anterior longitudinal incision 5 inches in length. The two fragments of the bone were removed. The quadriceps muscle was separated from the underlying bone. A full range flexion-extension movement was given. The lateral expansions of the quadriceps were reinforced with interrupted silk sutures. The divided ends of the aponeurosis could not be opposed in the centre due to the contracture of the quadriceps muscle. The deficiency was made up with continuous silk suture. The wound was closed. The joint was heavily padded with cotton wool and a firm bandage put on without any splint. The tourniquet was removed and the patient was returned to the bed. On the 3rd day after the operation a central stitch was removed to let out a small hæmatoma. Dressing was done on alternate days. At the end of a fort-

Fig. 2—Showing movement of the knee joint.

night he was allowed to stand and walk a little; massage and passive movements were started. He attended to his duties within two months of the operation.

He can now lift his leg above the waist and bend his knee to nearly a right angle and sit comfortably on a chair. Massage and movements are still continued and further improvement in the flexion movement is expected.

The technique of the operation is that of R. Brooke which was reported in the Medical Annual 1938. The operation is recommended in fresh cases but it has given satisfactory result in my old standing case.

RUPTURE OF THE MESENTERY

DIBYENDU SUNDAR RAY, M.B.
Honorary Surgeon, K. E. M. Hospital, Midnapore.

Rupture of the mesentery is not commonly met with in general practice. The following case may, therefore, be worthy of record.

N. S. Hindu, Male aged 12, came to the Outpatients' Department for the treatment of Colles's fracture of his left wrist, due to a recent fall from a tree about 14 feet high. On examination he complained of a slight tenderness in the left side of his abdomen. The fracture was set and put on splints. The patient left the hospital.

At 8 a.m. the next day he was brought to the hospital again for the following complaints:—1. pain and tenderness in the abdomen increasing gradually since the previous visit to the hospital. 2. No stool or flatus passed since the accident. 3. Nausea, but no vomiting.

On examination, the abdomen was found moderately distended and tympanitic. It was rigid and tender, more on the left. Tongue was clean and dry. Pulse 108 per minute, soft, small and regular. Respiration 48 per minute, regular. Temperature 98°F under the tongue. Rectal examination did not reveal anything abnormal.

A diagnosis was made of intestinal obstruction and the usual treatment was carried out without any improvement in the patient's condition.

In the evening, laparotomy was performed under chloroform, using a left paramedian incision. On opening the peritoneal cavity, blood—altered and fresh—was seen coming out. After careful examination of all the pelvic and abdominal viscera, nothing was found except a tear in the left side of the root of the mesentery, about 2 inches in length. It was stitched. All bleeding was secured and the abdomen closed in the usual manner. The patient passed flatus during the course of the handling of the intestines. He made an uneventful recovery without any complication.

VITAMIN C IN THE LATER VOMITING OF TYPHOID FEVER

A. V. S. SARMA, M.B., B.S., D.C.H,
Madras

Vitamin C has been found to be of great value in case of late vomiting in typhoid fever. In the two following cases, its effect was undoubted, when other drugs failed, when administered by the oral route.

Case I. Mr. V., 21 years old, was brought to Madras from a moffusil station because of uncontrollable vomiting on the 23rd day of his illness. Diet as well as medicine were being vomited. The liver was found to be soft and enlarged three fingers below the costal margin. The spleen was also soft and enlarged three fingers below the costal margin.

Three tubes of Cantanforte (vitamin C) were given intramuscularly on alternate days and this procedure controlled the vomiting completely. Redoxon

Roche (vitamin C) was given at the rate of three tablets per day right through the treatment.

Case II. Miss K. aged eight years. Eighteenth day of typhoid fever. Liver and spleen soft and each enlarged to two fingers below the costal margins. Vomiting was severe.

Redoxon (vitamin C) tablets, at the rate of three per day, controlled the vomiting. After a week the liver and spleen returned to the normal size and the illness as a whole took a favourable turn after the vitamin C was started.

Comment: Vitamin C is known to be useful in all toxæmic cases. In the two cases mentioned above, the liver was enlarged and soft, and vomiting was persistent, but vitamin C proved to be very effective in stopping the vomiting. It also appeared to influence the toxic condition favourably. In the second case the liver decreased definitely in response to vitamin C, which thus seems to have a definite action on the toxic condition of the liver.

I am indebted to Rao Bahadur Dr. M. R. Guruswami Mudaliar, B.A., M.D., C.M., for his help and guidance in the treatment of Case I.

CURRENT MEDICAL LITERATURE

MEDICINE

Left Ventricular Failure

Bedford (*Lancet*, June 10, 1939, page 1303) writes that in certain kinds of heart disease the left ventricle fails before the right causing pulmonary and pleural congestion without dropsy or systemic engorgement. The pulmonary congestion may be intensified by recumbent posture or by effort causing paroxysms of dyspnœa known as cardiac asthma. Early diagnosis is essential because pulmonary œdema requires prompt treatment by venesection, digitalis and diuretics. If the fact that in conditions of left ventricular strain pulmonary congestion may be the first and only sign of heart failure is appreciated the diagnosis of the condition becomes easy. Radiography is of immense help in diagnosis as it discloses both cardiac enlargement and pulmonary congestion and excludes intrathoracic neoplasm and chronic lung disease. The determination of the circulation time will reveal a higher value in paroxysmal cardiac dyspnœa than in bronchial asthma. Electrocardiogram may provide objective evidence of myocardial disease when clinical signs are lacking.

Immediate treatment consists of injection of morphine with or without atropine and venesection and later treatment consists of prolonged rest with digitalis and diuretics. The value of diuretics in pulmonary œdema is insufficiently recognised. Salyrgan produces often dramatic results. Once nocturnal dyspnœa is relieved morphine may be replaced by opiates by mouth and later on by luminal. These patients require careful supervision when they become symptom-free—they should lead less active life and must revert to the previous treatment whenever symptoms recur.

Anginal Syndrome Due To Hypothyroidism

Beaumont and Robertson (*Lancet*, March 25, 1939, page 682) report of a case, clinically diagnosed as angina of effort, who showed no other evidence of myxœdema except his basal metabolic rate being 33 and who was relieved of his anginal symptoms under adequate treatment with thyroid. The symptoms used to recur with either over or under dosage of thyroid. The authors point out that similar cases of the anginal syndrome associated with a low B.M.R. traced from the literature showed in all of them clinical evidence of myxœdema. They suggest that myxœdema and "masked hypothyroidism" must be excluded before a subtotal thyroidectomy is instituted for the relief of angina.

Abuse Of Purgatives

Hurst (*Clinical Journal*, June, 1939, page 219) observes that one of the commonest disorders met with nowadays is that which results from the abuse of purgatives. The patients complain of constipation though on detailed enquiry it is usually found that their stools are always unformed being either soft or liquid. All of them have additional discomfort associated with flatulence and distension and some have colicky pain. There is often lassitude, a feeling of tiredness and headache and these are due to toxæmia caused by the artificial diarrhœa produced

by the purgatives which they regularly take, some in smaller and others in gigantic doses. The purgative upsets the delicate mechanism of the ileocæcal sphincter and the semi-digested food soon comes in contact with swarming bacteria in the colon resulting in putrefaction of proteins, fermentation of carbohydrates and bacterial decomposition of fats. The toxins thus formed are absorbed. Hard dry fæces on the other hand do not undergo bacterial decomposition. The author treated successfully many such cases by taking off the aperient and giving them at first liquid paraffin or non-irritating vegetable mucilage daily later on gradually withdrawing it. The symptoms soon disappear. Agar agar is preferred to liquid paraffin as the latter is less easily taken, causes flatulence sometimes, may leak in the rectum apart from the fæces, tends to make defæcation fragmentary and proctoscopy reveals a more cleaner rectum with mucilage than with paraffin. There are cases of constipation, of course, where paraffin or agar agar is ineffective and the author recommends in those cases only cold infusion of senna pods. The latter acts upon the colon only so that the fermentation and putrefaction associated with ordinary purgatives are not produced. Moreover, the patient can easily regulate the dose of senna. Ten to fifteen drops of tincture belladonna may be added to the infusion if there is colicky pain. He concludes by noting that abuses of purgatives are many and uses few.

The Rational Use Of Digitalis

Gilchrist (Edinburgh Medical Journal, April, 1939, page 233) points out that the main object of prescribing digitalis is to relieve or prevent symptoms of congestive failure in its various types and when such symptoms are absent nothing can be gained by its use. Tachycardia in itself is seldom an indication for digitalis and bradycardia is not necessarily a contra-indication to its use. The pharmacological action and the therapeutic response of the drug should be distinguished as an excellent therapeutic response may be observed on certain occasions without much alteration in the rate of the heart. The maintenance dose of digitalis cannot be effectively regulated by the pulse rate alone and it requires the closest co-operation of the patient who can judge best the response to the drug. Routine treatment with digitalis in tachycardia of pneumonia, hyperthyroidism, shock and collapse and other toxic states is harmful and increases the mortality rate.

Colloidal Aluminium Hydroxide For Peptic Ulcer

Bennet and Gill (*Lancet*, March 4, 1939, page 500) report on the treatment of 30 cases of gastric, duodenal or anastomotic ulcer ranging in age between 29 and 72 getting marked relief of symptoms with colloidal aluminium hydroxide. It does not produce diarrhœa nor alkalosis which are the two drawbacks of the ordinary alkaline powders taken in these conditions. The author lays great stress on the diet which must not on any account be neglected.

SURGERY

The Treatment Of Intestinal Obstruction

Bottin (*Archives of Surgery*, 1938: 37: 375, Ref. *Surgery, Gynæcology and Obstetrics*, June, 1939, page 604) believes that intestinal obstruction produces an intoxication first of the blood and then of the tissues. In addition, there develops dehydration and demineralization of the blood and tissues. If the patient's condition is not too grave the operation may be postponed for a few hours during which period dehydration and demineralization should be attempted by an infusion of isotonic or slightly hypertonic solution containing chlorine, sodium, potassium and calcium.

An essential of surgical treatment of intestinal obstruction is always to practise the simplest kind of procedure *i.e.*, removal of the obstruction by the simplest method. A complicated operation may relieve the obstruction but will result in a large number of fatalities.

Post-operative treatment is also very important. Dehydration and demineralization are also necessary; Gastric lavage or better duodenal suction by Wangensteen method is excellent for removing the toxic material from the stomach and small bowel.

Post-operative ileus not due to inflammatory reaction in the peritoneum may be treated by gastric lavage, duodenal suction, hot application to the abdomen, hot and cold enemas and by use of such drugs as posterior pituitary extract, acetylcholine, physostigmine. The drugs mentioned are often useless but may be of some use in certain cases. Mor-

phine has not been found successful in the author's hands and he does not advise Leriche's method of spinal anæsthesia which may result in regrettable accidents. These methods may be harmful in cases of ileus due to peritonitis as they increase the peristaltic action of the bowels. Morphine may be of help in such cases in localizing the infection by splinting the bowel. The most effective therapy against post-operative ileus is according to the author the replacement of large quantities of fluids and minerals. Blood transfusion may be useful. Of all the therapeutic measures in the treatment of intestinal obstruction dehydration and demineralization give the most satisfactory results. In certain cases all these methods fail and in them a simple enterostomy may have a place.

Peritoneal Fluid In Perforated Peptic Ulcer

Davidson and others (*Surgery, Gynæcology and Obstetrics*, June, 1939, page 1019) from the bacteriological study of peritoneal fluid in cases of perforated peptic ulcer point out that the culture is usually sterile in the first six hours but not so afterwards when organisms like bacillus coli and streptococcus are found. They further observe that the post-operative course is smooth and the mortality low in bacteriologically negative cases whereas in positive cases more complications occur and morbidity and mortality rates rise up. So the drainage is indicated in cases operated upon many hours after perforation.

Fractured Patella Treated By Excision Of The Fragments

Dodd (*Lancet*, July 15, 1939, page 130) reports five cases of fracture of patella, three of them being over sixty years, being treated successfully by excision of the fragments. The technique is straightforward, patients soon return to work and full function of the knee is restored.

Heparin In The Prevention Of Thrombosis

Murray (*Lancet*, July 15, 1939, page 133) read a paper on the subject at a meeting of the Surgical Section of the Royal Society of Medicine in which he observes that heparin is non-toxic both in animals and human beings, that it prevents thrombosis and as such is valuable in determining success in operations on blood vessels and in cases in which thrombosis is a feature.

The Use Of Prostigmin Methylsulphate In The Prevention Of Post-Operative Intestinal Atony And Urinary Bladder Retention.

Marden and Williamson (*Surgery, Gynæcology and Obstetrics*, July, 1939, page 61) report that prostigmin given prophylactically (1 in 4000) both before and after operation is effective in reducing the incidence of post-operative intestinal atony and urinary bladder retention. No untoward effects followed its use except a mild abdominal discomfort in one case. If the urinary retention persists even after the usual dose of prostigmin as mentioned above injection of one ampoule of 1 in 2,000 prostigmin every hour for three consecutive doses will produce the desired results.

X-Ray Burns

Mandevile (*Radiology*, May, 1939, page 598) reports successful results obtained by application of fresh leaf of aloe vera for the treatment of x-ray burns of the skin and mucous membranes.

OBSTETRICS AND GYNAECOLOGY

Ectopic Pregnancy

Langman and Goldblatt (*Surgery, Gynæcology and Obstetrics*, July, 1939, page 65) from the study of an analysis of 310 cases in which patients were operated on for ectopic pregnancy or for some other condition but with an ectopic pregnancy found at operation observe that the pathological examination of the tubes removed reveals acute or chronic inflammatory changes in 50 per cent. cases though history of pelvic infection is obtained in only 20 per cent. cases, that erroneous diagnosis is made in 29·7% cases, the commonest cause of error being chronic salpingo-oophoritis and that the incidence of such error can be reduced by more frequent use of Aschheim-Zondek test (or Friedman modification). They further observe that pain is most often colicky, severe, irregular and generalised over the abdomen, radiation to shoulders is relatively uncommon but significant when present, that nausea and vomiting are far more frequent than fainting but the latter when present is pathognomic, that pain and bleeding in relation to the last menstrual period are extremely variable as to occurrence, duration and amount and often difficult to correlate,

ANTIDIURETIC SUBSTANCES IN ECLAMPSIA

Teel and Reid (*Endocrinology*, March, 1939, page 297) observe that specimens of the urine of pre-eclamptic and eclamptic women obtained during the period of water-retention have a marked antidiuretic action on water-diuresis of rats. The urine of a normal pregnant woman has an antidiuretic action only, if she is considerably dehydrated. The antidiuretic substance resembles the antidiuretic principle of the posterior pituitary.

AUTO-HÆMOTHERAPY FOR HYPEREMESIS GRAVIDARUM

Saxon and Stoll (*Illinois Medical Journal*, April, 1935, page 352) report successful results obtained by auto-hæmotherapy on the relief of hyperemesis gravidarum based on the allergic concept of the condition. The dosage ranged from 3 to 10 c.c. depending on the severity of the symptoms and the interval between the injections depends on the effect of the treatment. The author tried this method in 75 cases without a single failure.

PEDIATRICS

ENDOCRINE DISORDERS OF CHILDHOOD

Ellis (*Practitioner*, April, 1939, page 463) deals with the subject under two heads, *viz.*, (1) disorders of nutrition including obesity and wasting and (2) disorders of growth and development including infantilism and virilism and precocity. Fat children are encountered frequently—in some cases the obesity is a matter of great distress, in others it is placidly accepted as evidence of good digestion. On the basis of history and physical examination cases of obesity can be usefully grouped as follows though the distinctions are by no means rigid: (1) primary exogenous—in which there is excessive food intake with lack of exercise, (2) primarily endogenous—in which a personal factor is suggested by the family history, onset at puberty or normal caloric intake and (3) due to gross endocrine factor (hypothyroidism, hypopituitarism, pituitary basophilism and hyperadrenalism. Cases of this last type are by far the least common. Wasting in childhood may be due to diabetes mellitus and hyperthyroidism. Pituitary cachexia (Simmond's disease) and Addison's disease are extremely rare in this age period. Infantilism may arise from long standing disease of any one of the vital organs, *viz.*, kidney, heart, lung, liver, intestines or from generalised infection such as congenital syphilis. There are in addition certain well-defined endocrine types. Cretinism is one of the most perfect type of infantilism since not only does the child retain the size and proportions of infancy (as opposed to childhood) but the mental development is correspondingly delayed. Treatment with thyroid produces varying results—although the physical improvement is great in all cases the mental improvement is not so. To get the maximal benefit in physical and mental development the treatment should be made at the earliest possible time. Pituitary infantilism may be associated with diabetes insipidus, a variable degree of obesity or local symptoms due to a pituitary tumor. In some cases the condition is familial. Precocity and virilism in young boys have been found to be due in different cases to tumors of the pineal associated with hydrocephalus, tumors of the floor of the third ventricle, tumors of adrenal cortex and testicle. Precocious sexual development is rare in female infants and may be due to tumors of the ovary.

VACCINAL ENCEPHALITIS IN A CHILD AGED 14 WEEKS

Sakoschansky and Trenchard (*British Medical Journal*, June 17, 1939, page 1229) report of a case of vaccinal encephalitis in a child aged only 14 weeks. The child developed encephalitis two days after the formation of normal vesicles following vaccination with calf lymph 5 days previously. The child got rid of the trouble after being treated with whole blood injections (maternal and from an adult vaccinated 7 years before).

A THERMOMETER BREAKING IN THE RECTUM

Peiper (Ref. *Ars Medici*, March, 1939, page 132) writes that a thermometer breaking in the rectum of a suckling is more common than has been mentioned in the literature. It is inexpedient to remove the fragments with the aid of instruments as it has repeatedly led to complications that ended fatally. The author advises an enema with about 20 c.c. of glycerine immediately after the accident. During the subsequent normal evacuation of the bowels the reflex dilatation of the anal sphincter is so strong that glass splinters and mercury can be eliminated, whereas a reflex contraction results from artificial dilatation by instruments and this may easily lead to tears.

PROVINCIAL LANGUAGES AS MEDIUM OF INSTRUCTION IN THE MEDICAL INSTITUTIONS

There is no difference of opinion now in this country regarding the vehicle of education in the Universities. In the Calcutta University, Indian languages *e.g.*, Bengali, Hindi, Urdu etc., have been accepted as the medium of instruction for the Matriculation. We are very pleased to note that a definite demand has been formulated in the Bombay Presidency for imparting training in technical subjects, particularly Medicine in the language of the country. The memorandum which is printed below is worthy of serious consideration not only because of the intrinsic merit of the scheme but also the high standing of its sponsors. ED. *J. I. M. A.*

MEMORANDUM ON THE SUBJECT OF INTRODUCTION OF PROVINCIAL LANGUAGES AS MEDIUM OF INSTRUCTION IN THE MEDICAL INSTITUTIONS TO THE HON'BLE MINISTER OF HEALTH, BOMBAY.

To

THE HON'BLE DR. M. D. D. GILDER, B.A., L.M. & S. (Bom.), M.D. (Lond.), F.R.C.S. (Eng.), F.C.P.S. (Bom.),
Minister of Health, Council Hall, Poona.

SIR,

A couple of years ago when the people of this country expressed their unequivocal confidence in the programme of the Congress Party it was with a hope, that when they took over the government of the provinces they would introduce measures which would lead to a betterment in the different spheres of their life. One of the major improvements that was anticipated was the provision of wider educational facilities, *through the medium of their mother tongue*. Such educational facilities would have covered not only formal education, but also vocational and professional education. This hope is particularly strengthened by the opinions expressed by the leaders of the Congress Party in their speeches and in their writings. In view of these considerations, when the Government of Bombay recently notified their intention of discontinuing the L. C. P. S. course in their medical schools, we were emboldened to place before you for your consideration a scheme for a reorganisation of medical education in this province, particularly with regard to the use of Gujrati as the medium of instruction at Ahmedabad, and Marathi at Poona. The lead of Mahatma Gandhi in this matter is very clear, as he has referred to it in *Harijan* as follows: "English, having been made the medium of instruction in all the higher branches of learning, has created a permanent bar between the highly educated few and the uneducated many. It has prevented knowledge from percolating to the masses." Guided by this idea, the U. P. Government have recently declared their desire of introducing the provincial language as a medium of instruction in the colleges of the province in the course of the next ten years, and the Government of Bombay have made the following declaration in the Legislative Assembly while announcing the reopening of the Deccan College at Poona. "Our aims in matters of higher education" are "to develop the three linguistic divisions of our province as independent units complementing one another's work and contributing to the advancement of the province as a whole."* In pursuance of this policy they have recently granted recognition to the degree of the Indian Womens' University where the medium of instruction for all subjects (except English) is the mother-tongue of the pupils.

At the present moment, the training of all medical men, the record of hospital cases and their treatment, are being carried out in a foreign language. As a result of this, the most desirable co-operation between the physician and the patient does not exist to the same extent as in other countries, and the average man looks askance at scientific medicine, as something alien and imported from other countries. It is probably also for this reason, that contributions to the advance of medical knowledge from the people of this country have been relatively meagre, and a large number of medical men fail to appreciate the essential difference between the scientific method which is taught to them in another tongue and scholastic speculation which they come across in writings in their own language.

Till the end of the 17th and the early part of the 18th century medical education in all European Universities was carried out in Latin. With the growth of the national idea and the introduction of modern European languages in the Universities scientific knowledge suddenly seemed to cast off its scholastic fetters and blossomed out with great vigour in the different centres. This tendency has been steadily progressing to such an extent that in Europe (excluding Russia), with a population hardly greater than that of India, medical sciences are taught in more than twenty languages and every new centre is vying with others in the quality and quantity of scientific work turned out in its institutions. Even as late as 7 years ago the Flemish language obtained a recognition in certain provinces of Belgium, with a population of only 2 million people, and was gradually replacing French in the universities in Flanders. Certain provinces such as Quebec and Transvaal have continued their own language even after being incorporated in British Dominions, whereas other countries which have started institutions for teaching medicine have adopted their own language for this purpose. China, Japan, Turkey and Afghanistan, in our continent, can be cited as recent examples in this connection.

In our own country English was introduced as a medium of instruction in medical institutions on the basis of the recommendations of a committee appointed by Lord William Bentinck in 1834. The five members of the committee were divided in their opinion as to "whether instruction would be imparted in an Indian vernacular or in English. The Anglicists finally prevailed over the Orientalists, and it was emphatically laid down that a knowledge of the English language combines with itself the circle of all sciences and incalculable wealth of printed works and illustration, circumstances which give it obvious advantages over Oriental

* *The Times of India*, 11th July, 1939.

languages, in which are only to be found the crude elements of science, or the most irrational substitutes for it." However valid these considerations may have been 100 years ago, they do not possess the same significance in the scheme which is presented here, as medical students would be expected to be conversant with English so as to be able to read medical works and journals in that language.

It has been shown above and also widely accepted by most people who have thought over this subject that education when it is imparted in the mother-tongue leaves more lasting impressions on the minds of the individuals and stirs up mental processes which are more conducive to research and reasoned thinking. There is no reason to suppose, nor does the experience of other countries suggest, that technical education in different provincial languages in a big country like India would militate against the idea of a United Nation. It is our belief that clearer thinking resulting from such an education would, if anything, promote the ideals of co-operation and co-ordination between the members of the medical profession. However, certain objections may be raised against the introduction of provincial languages in medical institutions and they may be dealt with here.

The first is the difficulty of terminology. It is often stated that the terminology and text-books must be ready in a language before it could be used as a medium of instruction. But this supposition is not supported by facts. The S. N. D. T. Indian Women's University commenced teaching before text-books in Marathi or Gujerati were available. It is only recently, after an experience of over a decade, that text-books in these languages have begun to be published. The introduction of Urdu as a medium of instruction into the Osmania University presents a good example. Although H. E. H. The Nizam's Government had previously established a Translation Bureau for the preparation of Urdu text-books, the work of the bureau was not helpful to the medical faculty, because the translated books were not selected by experts and were not translated by specialists in the different subjects. They were to a certain extent inaccurate and unreliable and had become obsolete, as a result of the rapid advance of medical sciences, by the time the medical college was established. The students even now read English text-books but attend lectures delivered in Urdu. The material prepared by the teachers for their lectures is gradually accumulating and would very soon begin to be compiled into up-to-date books which would supplement the text-books in English. In Portuguese India most of the text-books employed by the students are in French, though the instruction is in Portuguese. In Japan, scientific medicine was first introduced by Dutch physicians. As the Dutch teachers were in the habit of referring to a large number of German books, German began to be widely used as the foreign language to be studied by medical students. With the establishment of Japanese Universities the Government engaged German professors on 10 or 15 years' contracts to organise instruction in their institutions, and German became the official language in medical schools. This was only a transitory arrangement. The Japanese assistants of the German Professors, after undergoing a thorough training abroad, took the place of the Germans and began to teach in Japanese. The terminology gradually developed and later on Japanese text-books began to appear, which are being used more extensively by the students, along with some German books. As this process of substitution of foreign by Japanese books developed at a number of different centres, great differences in medical terminology were found to exist. The unification and standardisation of the terminology was undertaken at a much later date and the process is continuously going on, even nearly 70 years after the introduction of the Japanese language. In China modern scientific medicine developed under different auspices and at different centres, and different languages were and are used in China though the official medium is Chinese. The most recent example where the difficulty of language and text-books had to be solved was in the case of Turkey which came under French influence towards the commencement of the last century and French became the language for higher education. At the commencement of the present century the young Turks and later the Government were very much influenced by the German political expansion towards the East and German language began to be largely used in the medical faculty of the Istambul University. Until recently Turkey has employed a large number of distinguished Jewish professors who had been expelled from Germany by the Nazi Government. However, in 1935, all these professors were instructed that after three years the medium of instruction would become Turkish and all of them must learn the language to be able to use it after that period. These examples have been selected to illustrate the fact that there was a bilingual period in all these Universities and that an elaborate preparation of terminology and text-books was unnecessary before the introduction of a new language medium. Terminology and text-books followed as a natural sequence. It may be added that in small countries like Holland, Denmark, Sweden and Portugal, where the sale of books in their own language is very restricted and the cost of publication proportionately high, English, French and German books are used by students to a very great extent, in additional to the books in their own language which is the medium of instruction and examinations.

The second objection which may be advanced is regarding the refusal of recognition of the courses of instruction in the proposed centres by the Medical Council of India. It should be noted that the Council has not recommended any particular language as a medium of instruction. The desired conditions laid down by them enjoin amongst other things that the students joining Medical Colleges should have studied English up to the Intermediate standard. Under the reciprocity arrangement they also recognise the Japanese and Italian degrees without insisting on a knowledge of English. There is therefore no reason to believe that qualifications granted after completion of a carefully worked out programme of education would be debarred on the ground that a provincial language has been used as the medium of instruction. The experience of the medical faculties of Vizagapatam and Patna shows that even with the use of English it took 10 to 15 years before the degrees granted by these Universities were recognised by the Council. During this period they were recognised by the provincial Councils and Governments. It need not be pointed out that provincial recognition is far

more important to a vast majority of practitioners than non-provincial or a foreign recognition. However, Osmania undergraduates are now allowed to appear for the Primary Fellowship Examination held in India and the Bombay Provincial Council registers their graduates. It is likely that further recognition by other provincial and foreign councils would follow in course of time.

A fear is often expressed that the standard of medical education would show evidence of deterioration with a change of language in which the instruction is imparted. It is the opinion of experienced teachers that with the exercise of proper care in the planning of the curriculum, in the appointment of suitable teachers and examiners the standard should show a definite amelioration instead of a deterioration. The first teachers should have real faith in and enthusiasm for the innovation, in addition to being experts in their subjects.

The following scheme is, therefore, tentatively suggested. A two years' college course after the Matriculation Examination should be carried out in a separate preparatory (pre-medical) institution or college attached to the medical schools. This preparatory college is expected to be almost self-supporting and will not be a financial burden to the medical college, as it should be possible to employ lecturers from the staff of the existing arts and science colleges and also from the medical college on a part time basis. A curriculum best suited as a preliminary to the medical course should be drawn up, including English as one of the subjects to be taught in those two years. Such a course would be designed to continue the education received by the students up to the Matriculation Examination in a provincial language, which is now permitted by many Universities or Boards in India and at the same time prepare them in the essentials of the basic subjects necessary for the medical studies. It is suggested that two independent bodies may be created by an Executive order of Government, preliminary to the passage of an act through its different stages in the local legislature, making them responsible for the management of the two medical schools or colleges in the province and the organization of the medical education in the language of the corresponding area. They may be called The Gujerat Academy and The Maharashtra Academy of Medical Sciences. In course of time they may develop into full medical universities having more than one faculty and they will then control education in different branches of medical practice (e.g. medicine, dentistry, pharmacy, veterinary medicine, etc.). This idea of a medical academy is not new. Dusseldorff is such a medical academy for granting medical degrees only, and Cologne was originally one such academy before it developed into a full University. Many universities in India do not possess all faculties, some have only two *viz.*, Arts and Science. The Indian Institute of Science at Bangalore possessing a constitution similar to some of the Indian Universities has been founded only for the purpose of promoting education and research in Chemistry and Electrical technology and grants its own diplomas in those subjects. However, there should be a provision in the act allowing these academies to merge themselves into full Universities whenever they will be established or to federate with similar academies dealing with other branches of knowledge. The object of these academies shall be unification and organisation of the medical profession with a view to promote and conduct medical education and research. The chief means of carrying out this object shall be by establishing a medical college in association with one or more hospitals situated in the respective linguistic area. The constitution of the academy shall be partly on the lines of the learned societies but mainly on those of the teaching universities in the United Kingdom, the only difference being in the closer association with the Government and the Municipal hospitals, as well as the voluntary hospitals and infirmaries and a greater mobilisation of all available facilities for the training of students. It is not proposed to discuss the details but it may be added that it would be advisable to build up the constitution of these bodies from below upwards. The Boards of studies and the teaching Departments would form the units which would be co-ordinated in a central administrative body, rather than that an assembly of persons like the Senate of a University should split itself into smaller bodies leaving the direction of medical studies to persons, not associated with educational institutions who may be swayed by fleeting ideas in vogue at any particular time. It is our opinion that the units should federate to form a corporate body, the Academy, on which the Government, the donors, the patrons and the medical graduates would be represented. The scheme may be summarised as under:—

It is proposed that the two Government Medical Schools should be converted into medical colleges teaching through the principal language of the region. There may be a transitional bilingual period during which English text-books and to a certain extent international (European terminology) will be used. The control and conduct of education shall be vested in bodies called The Gujerat and the Maharashtra Academy of Medical Sciences. These bodies will be medical teaching Universities. The staff shall be carefully selected with a view to make the scheme a success. The Heads of the departments, Professors, Readers, Lecturers, etc., shall be appointed not as members of a service cadre but on "chair basis," similar to the appointments recently announced for the New Deccan College. These shall be University or Academy "chairs." The occupants of the chairs of clinical subjects shall be *ex-officio* members of the staff of the associated hospital departments. The departments of the college and the boards of studies shall be the units, which together with certain other representatives shall constitute the Academy. The course leading to graduation shall cover seven years of which two years will be devoted to general preparatory education corresponding to the Intermediate Science examination and will be spent at a special preparatory college attached to the Medical College. The next two years will be devoted to preclinical subjects like (1) Anatomy, Embryology, Histology, (2) Physiology, (3) Biochemistry, etc., and the last three years to clinical and applied laboratory subjects according to the plan and the standards laid down by the Medical Council of India.

We have the honour, etc.

JIVRAJ N. MEHTA, V. R. KHANOLKAR, B. B. YODH, A. S. PARANJPE, G. M. KURULKAR and others.

Bombay,
13th July, 1939.

ASSOCIATION NOTES

Minutes or proceedings of Branches and Affiliated Societies intended for publication should be sent to the General Secretary of the I. M. A., Samavaya Mansions, Calcutta—EDITOR.

BENGAL PROVINCIAL BRANCH

Proceedings of a meeting of the Bengal Provincial Council of the Indian Medical Association held on Tuesday, the 20th June, 1939, at 7-30 p.m. at the Association Hall at 67, Dharamtala Street, Calcutta:

Members present—Dr. A. D. Mukherji (in the chair), Dr. Suren Sen (Faridpur), Dr. M. Chatterji (Howrah), Dr. Jibananda Mukherji (Howrah), Dr. B. K. Ghosh (Barrackpore), Capt. A. C. Banerjee (Baruipur), Dr. J. K. Mazumdar (Calcutta), Dr. P. K. Guha (Calcutta), Dr. B. N. Ghosh (Calcutta), Dr. S. C. Chatterjee (Calcutta), Dr. S. K. Bose (Calcutta), Dr. K. K. Sen Gupta (Calcutta), Dr. S. K. Datta (Calcutta), Dr. J. C. Banerjea (Calcutta), Dr. K. C. Chakraborty (Calcutta), Dr. T. N. Ghosh (Calcutta), Dr. B. Banerjea (Calcutta), Dr. Subodh Datta (Calcutta), Dr. Sambhu Mukherji (Calcutta), and Dr. P. C. Roy (Calcutta).

1. The proceedings of the last meeting were read and confirmed.

2. The statement of accounts for the month of May 1939 was inspected.

3. The Bengal Medical (Amendment) Bill, 1937, as introduced by Mr. Anukul Chandra Das, M.L.A., in the Bengal Legislative Assembly, was placed before the house. Resolved that a sub-committee consisting of the following members be formed to consider the same and submit its report as early as possible:—Drs. A. D. Mukherji, K. C. Chakraborty, P. C. Roy, P. K. Guha, Jibananda Mukherji, Suren Sen and K. K. Sen Gupta.

4. The *ad interim* report of the sub-committee appointed to draw up a scheme for Rural Medical Relief for this province was considered and adopted.

5. The letter dated 18-5-39 from the Hony. General Secretary, I. M. A. re: tour of Dr. G. Da Silva, President, was considered.

Resolved that branches be written to, to ascertain whether they are willing to extend their hospitality to Dr. Da Silva, President, All-India Medical Association so that a tour programme may be drawn up accordingly.

6. Resolved that this Provincial Council endorses the scheme of the Central Council as mentioned in the copies of correspondence with the Indian Life Assurance Offices Association in connection with the scale of medical fees.

7(a) Resolved that the letter dated 13-6-39 from the Secretary, Midnapore Branch, forwarding a copy of the proceedings of their annual general meeting held on 7-6-39 be recorded.

(b) The letter dated 20-6-39 from Dr. J. K. Mazumdar, Calcutta, re: appointment of an Honorary Visiting Physician in the Calcutta Medical College, without proper advertisement, in the Psychiatry and Neurology Department to be started shortly, was considered.

Resolved that enquiries be made of the Principal, Calcutta Medical College, the Surgeon-General with the Government of Bengal and the Minister in charge of the Public Health and Local Self-Government, Bengal, in order to ascertain whether any advertisement was issued calling for applications from likely candidates and whether the announcement made in the press is a correct one.

With a vote of thanks to the chair, the meeting terminated.

K. K. SEN GUPTA, *Jt. Hony. Secretary.* SUBODH DATTA, *Chairman.*

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Proceedings of a meeting of the Bengal Provincial Council of the Indian Medical Association, held on Tuesday, the 18th July, 1939, at 7-30 p.m. at the Association Hall, at 67, Dharamtala Street, Calcutta:

Members present—Dr. Subodh Datta (in the chair), Drs. Suren Sen (Faridpur), J. Mukherji

(Howrah), B. K. Ghosh (Barrackpore), A. C. Bose (Darjeeling), A. D. Mukherji (Calcutta), T. N. Ghosh (Calcutta), K. C. Chakraborty (Calcutta), J. C. Banerjea (Calcutta), K. K. Sen Gupta (Calcutta), S. Mukherji (Calcutta), S. C. Chatterji (Calcutta), B. N. Ghosh (Calcutta), A. K. Acharya (Calcutta), S. K. Bose (Calcutta), P. C. Roy (Calcutta), Capt. H. Mukherjee (Calcutta), and Dr. P. K. Guha (Calcutta).

1. The proceedings of the last meeting were read and confirmed.

2. The statement of accounts for the month of June, 1939, was inspected.

3. The letters received from the district branches in connection with the holding of the ensuing third Bengal Provincial Medical Conference, were placed before the meeting. Resolved that consideration of the matter be postponed till the next meeting.

4. The report of the Bengal Medical (Amendment) Bill, 1937, Sub-Committee as mentioned below, was considered and was adopted:—

(i) This committee is of opinion that under no circumstances should any one be admitted to the Register maintained by the Bengal Council of Medical Registration, without appearing at the Final Licentiate Examination of the State Medical Faculty.

(ii) This committee is of definite opinion that those who have qualified prior to 1914 are mostly not in the land of living now and those of them who are still alive and are carrying on their professional work all these 25 years hardly need any protection as contemplated in the amendment proposed.

(iii) This committee is of opinion that those who have completed full course of training in Calcutta Medical School, National Medical Institute and Bankura Sammilani Medical School which institutions have since been recognised by the Bengal Council of Medical Registration prior to such recognition might be admitted to the Register if they pass the Final Licentiate Examination of State Medical Faculty of Bengal under special transitory provision to be arranged.

(iv) The committee feels that in view of the possibility of the same question of "granting recognition" cropping up from time to time in future, the Government should abolish all institutions which are not up to the standard.

5(a) The letter dated 30-6-39 from the Hony. General Secretary, I. M. A. was placed before the meeting.

Resolved that the following gentlemen be nominated President and Vice-Presidents of the All-India Medical Association for the ensuing year (1939-40):—

President—Sir U. N. Brahmachari, Kt. (Calcutta).

Vice-Presidents—(1) Dr. A. D. Mukherji, (Calcutta), (2) Dr. Sunil C. Bose (Calcutta), (3) R. Amesur (Karachi).

(b) The letter dated 18-6-39 from the Hony. Assistant Secretary, The Howrah Medical Society (Howrah Branch of the Indian Medical Association) was placed before the meeting.

Resolved that the proceedings of the Meetings of the Bengal Provincial Council of the I. M. A. be sent to all district branches to keep them informed of the activities of this Provincial Branch, as the same are not regularly published in the pages of the journal of the Association.

With a vote of thanks to the chair, the meeting terminated.

K. K. SEN GUPTA, *Jt. Hony. Secretary.* SUBODH DATTA, *Chairman.*

CALCUTTA BRANCH

Proceedings of a meeting of the Executive Committee of the Indian Medical Association, Calcutta Branch, held on Tuesday, the 4th July, 1939, at 8 p.m. at the Association Hall:

Members present—Dr. P. Chatterjee (in the chair), Drs. P. Sannyal, K. K. Sen Gupta, P. C. Roy, T. N. Ghosh, S. Mukherji, A. K. Acharya, B. N. Ghosh, K. Chakraborty, J. C. Banerjea, B. K. Sarkar, K. K. Ghosh, Capt. R. P. Banerjee, Drs. Subodh Datta, P. K. Guha, S. C. Chatterjee, S. K. Bose and Capt. M. Mukherjee.

1. The proceedings of the last meeting were read and confirmed.

2. The statement of accounts for the month of June, 1939 was inspected.

3. The *ad interim* report of the Public Medical Service Scheme Sub-Committee was considered.

Resolved that the scheme be circulated to the members of the Executive Committee for consideration at a special meeting of the Committee.

4. The letter dated 20-6-39 from Dr. P. C. Sen Gupta re: appointment of an Hony. Visiting Physician, without any advertisement, in the Calcutta Medical College in a new Department of Neurology and Psychiatry to be opened shortly, was placed before the meeting.

Resolved that proper authorities be approached to verify the correctness of the report.

5. The letter dated 4-6-39 from Dr. S. K. Basu was considered.

Resolved that the Bombay Medical Council be requested to let this Association know as to what steps they have taken in that matter.

Further resolved that the Minister in charge of the Medical Portfolio and the Surgeon-General with the Government of Bengal be requested to take steps to prevent the influx of foreign doctors.

6. The correspondence that passed between the Secretary and the Secretary, Chittaranjan Seva Sadan re: appointment of a Visiting Officer in the said institution, without advertisement, was placed before the house.

Resolved that another reminder be sent to the Secretary, Chittaranjan Seva Sadan and if no reply be forthcoming within a reasonable time, the whole correspondence be released to the press.

7. The correspondence that passed between the Secretary of this Branch and the Hony. General Secretary, I. M. .A, re: non-publication of proceedings of the Executive Committee meetings in the journal of the Association was considered.

Resolved that consideration of the matter be postponed to the next meeting. In the meantime the Secretary be requested to send another reminder to the Hony. General Secretary, I. M. A.

8. The letter dated 30-6-39 from the Hony. General Secretary, I. M. A., was considered.

Resolved that the following gentlemen be nominated President and Vice-Presidents of the All-India Medical Association for the ensuing year (1939-40):

President—Sir U. N. Brahmachari, Kt., (Calcutta).

Vice-Presidents—(1) Dr. A. D. Mukherji (Calcutta). (2) Dr. Sunil C. Bose (Calcutta). (3) R. Amesur (Karachi).

Resolved further that an invitation be extended to the XVII session of the All-India Medical Conference in December, 1940, at Calcutta, on behalf of this Branch.

9. The consideration of some other items under the head "Miscellaneous" was postponed till the next meeting.

With a vote of thanks to the chair, the meeting came to a close.

P. C. ROY,
Hony. Secretary.

SUBODH DATTA,
Chairman.

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Proceedings of a special meeting of the Executive Committee of the Indian Medical Association, Calcutta Branch, held on Wednesday, the 19th July, 1939, at 8 p.m. at the Association Hall:

Members present—Capt. Raghupati Banerjee (in the chair), Drs. P. K. Guha, B. N. Ghosh, K. C. Chakraborty, K. K. Sen Gupta, J. C. Banerjea, P. C. Roy, T. N. Ghosh, B. Banerjee, S. C. Chatterjee and Capt. M. Mukherjee.

The report of the Public Medical Service Scheme Sub-Committee, as circulated, was placed before the house and the following resolutions were passed unanimously:

1. Resolved that a Central Body be formed by the Executive Committee and placed before the general body for ratification.

The Board of Consultants and Specialists will be formed in a joint meeting of the Central Body and the Executive Committee.

The following amendments were moved by Dr. P. K. Guha but they were lost:

1. Resolved that the clause 2 (schedule) of the Rules and Regulations of the proposed Public Medical Service Scheme be amended as follows:

(a) Contributors with monthly income of Rs. 50/- or less shall pay annas four only per month for self an annas two only per month for each dependent.

(b) Contributors with monthly income of over Rs. 50/- and up to Rs. 100/- shall pay annas eight

per month for self and annas four only per month for each dependent if the number of dependents be be four or less. If the number of dependents be more than four, the contributor shall pay annas three per month for each dependent.

(c) Contributors with monthly income of over Rs. 100/- and up to Rs. 175/- shall pay Re. 1/- only per month for self and annas six only per month for each dependent if the number of dependents be four or less. If the number of dependents be more than four, the contributor shall pay annas four only per month for each dependent.

(d) Contributors with monthly income of over Rs. 175/- and up to Rs. 250/- shall pay Rs. 1/8/- per month for self and -/8/- for each dependent if the number of dependents be four or less. If the number of dependants be more than four, the contributor shall pay annas six only per month for each dependent.

(e) Contributors with monthly income above Rs. 250/- may join the scheme on application to the central organisation and on special conditions.

2. Resolved that the sub-clauses (c) and (d) of clause 5 of the Rules and Regulations of the proposed Public Medical Service Scheme be amended as follows:—

5(c) The contributor agrees to pay a sum of annas four only between the hours of 7 a.m. and 10 p.m. and annas eight only between the hours of 10 p.m. and 7 a.m. per visit as conveyance charges if the residence of the contributor is within three miles from the clinic or from the doctor's house.

5(d) The contributor agrees to arrange for a suitable conveyance, if the call be urgent.

The *ad interim* report of the sub-committee, as circulated, was accepted by a majority of votes.

P. C. ROY, *Secretary.* SUBODH DATTA, *Chairman.*

JALPAIGURI BRANCH

The following resolution was passed at a meeting of all the medical practitioners of the town held on 30-7-39 under the auspices of the Jalpaiguri Branch of the Indian Medical Association.

"This meeting of the medical practitioners of Jalpaiguri express their heart-felt sorrow at the sad demise of Dr. Suresh Chandra Sengupta, a senior medical practitioner of this town and President of the Indian Medical Association, Jalpaiguri Branch, and convey their sincerest sympathy to the members of the bereaved family".

S. C. BHOWMIK,
Jt. Hony. Secretary.

NASIK BRANCH

It has been resolved to hold a fourth Maharastra Karnatak Medical Conference at Nasik on 3rd, 4th and 5th November, 1939. The local members desire that Dr. Da Silva, President of the Indian Medical Association who is touring the whole of India with a view to extend the scope and organisation of the Association, may be requested to kindly visit the Nasik District at the time of the Conference. He will meet many prominent doctors from various places on this side of the country and have a good chance to do propaganda work on behalf of the Association amongst medical men.

P. S. GUPTE,
Hon. Secretary.

GHAZIABAD BRANCH

Proceedings of a meeting of the Indian Medical Association, Ghaziabad Branch, held at Dr. M. L. Garg's place on 26th June, 1939 at 11 a.m. and presided over by Dr. Rajeshwar Singh:

Members present—Drs. A. Rahim, A. L. Taneja, Balwant Rai, N. Chakarvarty, Mrs. Amar Dass, Rajeshwar Singh, M. L. Garg.

The proceedings of the last meeting were read and confirmed unanimously.

Resolved that this Branch of the Indian Medical Association expresses its deep sense of sorrow at the sudden and untimely demise of Rai Sahib Dr. Surajmal Sarin of Dholpur, President of Provincial Council and conveys its heart-felt condolence to the bereaved family.

Resolved that this Branch of the I. M. A. expresses its heart-felt pleasure and congratulates our member Dr. (Mrs.) Amar Dass on her being awarded the Kaisar-i-Hind Medal, which is a great honour for her and for the Branch.

M. L. GARG,
Hony. Secretary.

JALNA BRANCH

Proceedings of a meeting under the joint auspices of I. M. A. and J. M. A. held on 26th June, 1939, at 9 p.m. in the Civil Hospital and presided over by Dr. Joshi:

Dr. Subramania read his paper on Guinea worm. While discussing the treatment he told his experience of extracting the worm *in toto* by injecting Ol. Terebenth at the site which though it alarms the patient by causing violent inflammation, facilitates its easy removal.

Dr. Nazeer Mohiuddin said that he pulled out the worm by merely putting a drop or two of the oleum and massaging the tract.

K. N. PAKNIKAR,
Hony. Secretary.

RAMNAD DISTRICT MEDICAL ASSOCIATION

Proceedings of the Managing Committee meeting held on 22-7-39, at S. A. Board Dispensary, Kandukathan:

Members Present—Captain B .Dayanantha Rao (President, in the Chair). Drs. E. Ivatts, K. S. Srinivas, and S. Rajaram Bharathi.

1. Accounts as it stood on 20-7-39.

2. The following amendments to the rules were proposed from the Chair to be placed before the General body:—

I. Regular members pay Rs. 7/- a year and the branch contribution of Rs. 3/- to the Indian Medical Association, Calcutta to be remitted from this amount. In the case of Rural Practitioners they can be treated as associates when they pay only Rs. 2/- a year and in the case of those who want the Journal of the Indian Medical Association an extra sum of Rs. 3/- per year has to be contributed by them.

II. The post of Secretary and Treasurer be combined and that the duties of the Treasurer be added on to those of the Secretary. The number of other members of the Managing Committee be increased from four to five.

III. The re-opening of the Postal Savings Bank Account be expedited and all receipts be paid into the Account then and there.

IV. The Annual Meeting to be arranged in September 1939, inviting The Hon'ble Doctor T. S. S. Rajan, Minister for Public Health to preside over the function.

V. The arrears of subscription due for 1937-38 may be recommended to be written off at the next General Body Meeting.

VI. A Committee be constituted at the next meeting at Karaikudi for making all arrangements for the Annual gathering to be held in September, 1939.

B. DAYANANTH RAO,
President.

* * *

Proceedings of the July meeting of the Ramnad District Medical Association held at the S. A. Board Dispensary, Kanddukathan on the 22nd July 1939, with the President of the Association Captain B. Dayanantha Rao in the chair:

Doctors E. Ivatts and W. N. Edward entertained to tea those assembled.

The minutes of June meeting held at Ramnad was read by the Secretary and adopted.

Dr. Krishnaswami of Aruppukottah read a detailed interesting paper on "Medico Legal Work" followed by a discussion on which Dr. S. Rajaram Bharathi, T. S. Sivaramakrishnan, J. K. Tirunavukkarsu, S. Janakiraman and K. S. Srinivas took part.

The following were nominated for the offices of the President and Vice-Presidents of the Indian Medical Association for the ensuing year:

President—Jivraj N. Mehta, M.D., M.R.C.P., Bombay.

Vice-President—(1) S. Subba Rao, Bangalore. (2) Sir Nilratan Sircar, Kt., M.A., M.D., D.C.L., Calcutta. (3) B. Thangamma, F.R.C.S.E., Kamacha, Benares City.

The Secretary announced that the Committee which met earlier passed the following:—

1. Amendments to rules of the Association were recommended to the General Body to be con-

sidered at the next Annual meeting proposed to be held in September, 1939. Notices of the amendments will be duly circulated.

2. The Hon'ble Dr. T. S. S. Rajan, Minister of Public Health to the Government of Madras be invited to preside over the annual gathering.

3. To constitute a committee at the next monthly meeting at Karaikudi on the 19th August, 1939 for making arrangements for the annual meeting in September, 1939.

The Secretary requested the members to pay up all arrears of subscription so that the contribution of the branch may be remitted to the Indian Medical Association without further delay with the arrear list of members of this Branch.

It was also announced that as the meetings were held only on the penultimate Saturdays of each month which is a public holiday all medical officers can attend these meetings without taking any casual leave.

With a vote of thanks to the hosts of the evening, the Chairman and those assembled the meeting terminated.

K. S. Srinivas,
Hony. Secretary.

KRISHNA DISTRICT MEDICAL ASSOCIATION

Proceedings of the third monthly meeting of the Krishna District Medical Association, held at Gudivada on the 15th July, in the Travellers' Bunglow and presided over by Lt.-Col. T. S. Shastry, I.M.S., the President:

Fifty members including seven women members, attended. The Chairman and the Commissioner of Gudivada also attended. Four new members joined the Association. Two members left the Association, because they were transferred from the district. Altogether, there are now 91 members on the roll.

The meeting began precisely at 4-30 p.m. with tea and refreshments. There were some items of music. Dr. M. Gurrazu and Dr. Prasada Rao entertained the audience with their vocal music, which was much appreciated.

(1) A resolution was unanimously passed requesting the Government to prohibit foreign doctors (Jews or others), from settling in our country, and practising as doctors with whose States India has no reciprocity for medical practice.

(2) The question of the rates of Insurance fees, mentioned in the letter from the Central Council of the I. M. A., Calcutta, was read out, and the President exhorted the members to assert their own self-respect, and the dignity of the medical profession by obeying the directions of the Indian Medical Association.

(3) The question of arrears—The President appealed to their sense of duty, and urged the members to pay up all the arrears.

(4) Dr. E. Sunderaramareddi, B.A., L.M. & S., B.S. SC., District Health Officer, lectured upon the pertinent portions of the New Health Act, and pointed out that it now becomes the duty of all doctors to report all their infectious and venereal cases at once.

Dr. K. V. Subba Rao, L.M. & S., Honorary Assistant Medical Officer of the Headquarters Hospital. Masulipatam exhibited a patient of toxic goitre and discussed all aspects of the case.

Dr. S. Sree Rama Rao, L.M.P. of Kanumole, read a paper on thermal fevers. Dr. N. Rama Rao, L.M.P. of Gollapalli, read his case notes on Urticaria Gigans. Dr. H. C. Halge, I.M.D., the Medical Officer of the Government Hospital, Bezwada, read a paper on the expectant treatment of appendicitis. Dr. A. Narayana Rao, M.B.B.S., the Medical Officer of the Government Hospital of Gudivada, showed two cases of (1) hepatic abscess and (2) abdominal cyst.

The President discussed in detail the cases read and presented. He exhorted the members to get more members to join them, and to take a keen interest in and to give active support to the Indian Medical Association in our District.

Our Association held a successful Health Exhibition in the morning, in the Board High School, Gudivada. This was opened by Mr. M. Karamatulla, I.C.S. (The Collector), who impressed on the very large audience the great need of all our people being educated in matters of health and disease. The District Health Officer, placed his posters, models, etc., at the disposal of our Association. At the same time, a Branch of the Red Cross Society was opened by Begum M. Karamatulla.

Thanking all the lecturers, ladies, members, and non-members present, the President dissolved the meeting, and adjourned to dinner at about 9 p.m.

K. V. SUBBA ROW,
Secretary.

VIZAGAPATAM DISTRICT BRANCH

Proceedings of the fifth meeting of the branch held in the Medical College, Vizagapatam, on Saturday, the 22nd July, 1939, at 4 p.m.:

After an enjoyable tea-party, the members assembled in the Pathology block.

Captain K. K. Nambyar, the President of the association, took the chair.

The minutes of the last meeting were read and passed. Then, Dr. K. Krishnamurty of Chodavaram read a paper on common diseases of the Eye This was followed by the demonstration of a series of cases by Dr. T. K. Raman: (a) Duodenal ulcer with transposition of viscera, (b) Deficiency diseases (nicotinic acid), (c) Brucella infection.

Dr. R. Viswanathan: (a) Demonstration of induction of phneumothorax, (b) X-ray pictures, (c) Tomograph.

Dr. M. N. Prabhu: (a) Mastoiditis, (b) Sinus thrombosis, (c) Sinusitis simulating mastoid.

Dr. M. V. Ramanamurty: (a) Supracondylar fracture.

Dr. M. G. Kini: (a) Injuries about the elbow.

Dr. V. Govindan Nair: (a) Infective Granuloma, (b) Various manifestations of secondary syphilis, (c) Scrofulodermia, (d) Leprosy with reaction.

All the demonstrations were followed by discussion. After a vote of thanks to the President, the lecturer, those who demonstrated the cases and to the Principal of the Medical College, the meeting terminated late in the night.

V. GOVINDAN NAIR,
Hony. Secretary.

XVI ALL-INDIA MEDICAL CONFERENCE, LAHORE, 1939

The XVI All-India Medical Conference will be held in Lahore during the coming Christmas week. Members of the medical profession and delegates from various branches are expected to muster strong at the Conference to define the scope of their work in view of the special situation created this year on account of War and to decide other momentous questions of an All-India character.

The Conference will thus afford an excellent opportunity to business firms to advertise their goods in the Conference Exhibition. Intending parties are requested to communicate from now on with the General Secretary, Lahore Medical Conference, 28, Nisbet Road, Lahore, for all information regarding location, size, rent of stalls etc.

MEDICAL NOTES AND NEWS

XVI ALL INDIA MEDICAL CONFERENCE LAHORE, 1939

The next All India Medical Conference will be held in Lahore during the coming Christmas—the exact dates of the Conference will be notified later on. This is the only occasion when medical men from all parts of India get an opportunity to come in contact with one another and exchange views on medical politics and matters of general professional interest. In view of the special situation created this year on account of War, a heavy duty and responsibility rests upon the profession to define the scope of their work in connection with various war services and A. R. P. measures that have been organised in various towns and cities. This Conference therefore is going to be very important from the medical man's point of view as it will have to decide momentous questions of a very serious, All-India character. Members of the medical profession and delegates from various branches are requested to muster strong at the Conference and help it to come to a successful conclusion of its deliberations by participating in all its proceedings.

The Conference, as usual, will afford an excellent opportunity to business firms to advertise their goods in the Conference Exhibition.

The following is the personnel of the Reception Committee of the XVI All-India Medical Conference, Lahore:

Chairman—Dr. Daulat Ram, M.B., B.S.

Vice-Chairmen—Dr. Prem Nath, M.B., ch.B., L.D.S., Dr. Mrs. Damyanti Bali, L.S.M.F., Dr. B. J. Sahni, M.B., ch.B., D.P.H.

General Secretary—Dr. C. L. Bhola, M.B., B.S., M.R.C.P., D.P.H., D.T.M. & H.

Propaganda Secretaries—Capt. R. C. Goulatia, M.B., B.S., Dr. Mohd. Abdul Haque, M.B., B.S., B.D.S., L.D.S.

Secretaries for Reception, Accommodation and Entertainment—Dr. D. R. Narang, M.B., B.S., L.R.C.P., M.R.C.S. Dr. Guranditta Mal Khosla, M.B., B.S.

Secretary for Scientific Section—Dr. B. L. Kapur, M.D.

Secretary for Exhibition Section—Dr. D. C. Chopra, M.B., B.S.

Financial Secretaries—Dr. Ganeshi Lal, M.B., B.S., Dr. Diwan Chand Aggarwal, M.B., B.S.

KRISHNA DISTRICT MEDICAL ASSOCIATION

The Krishna District Medical Association, Masulipatam, will hold a medical exhibition at Masulipatam on the 14th of October, 1939, in connection with its anniversary.

It will publish an Annual Report which will contain the addresses of members. This will be circulated among many of the doctors in the Presidency.

Advertisements for insertion in the Annual Report will be accepted till the end of September next. Stalls will be set apart for manufacturing or business houses exhibiting the following:—(1) articles of hospital equipment, (2) surgical instruments, (3) drugs, (4) diet, etc., (5) linen, useful for patients in every respect (khadi only).

Applications for stalls and other details should reach the Secretary before 30th September, 1939.

MAHARASHTRA & KARNATAK MEDICAL CONFERENCE

The Fourth Maharashtra and Karnatak Medical Conference, Nasik, will be held at Nasik on 3rd to 5th November, 1939 (both days inclusive). Dr. V. R. Khanolkar, B.SC., M.D. (Lond.), Head of Pathology Department and Professor of Pathology, Seth Gordhandas Sunderdas Medical College, Parel, will preside. There will be open discussion on the Streptococcal Infections, their bacteriology, diagnosis and treatment. All medical men are requested to attend the Conference.

POST-GRADUATE "REFRESHER COURSE" IN BOMBAY

The attention of registered medical practitioners is drawn to the proposed "Refresher Course" in Bombay. Below is printed a circular, dated 26th July, 1939, issued by Dr. Jivraj N. Mehta, Dean of the Seth Gordhandas Sunderdas Medical College, Bombay, on the subject.

It is proposed to organise a "Refresher Course" for Registered Medical Practitioners for a period of three weeks in the month of October, 1939, in joint association with the members of the staff of the Grant Medical and Seth G. S. M. Colleges and of the associated Hospitals. It is further proposed that the course should be held annually in the October vacation.

I shall be thankful to know if you would be able to help in the organisation of the proposed course and if so, to let me know the subject of your clinical lectures and demonstrations. You will not be required to hold more than three classes.

From the assurance that Col. Bhatia and I had last year from the teachers in the respective institutions, it would seem that a very large number of the members of the staff of both the Colleges and associated Hospitals would be helping us in the organisation of the proposed course. In that case, instead of troubling each member of the staff each year to participate in the course, it is proposed that certain members of the staff might be requested to help in the year 1939 course, some others in 1940 and the rest in 1941 and so on. It would be helpful if you would therefore let me know the subjects on which you would prefer to give clinical lecture or hold a demonstration and whether you would prefer to participate in any particular year or whether any out of the said three years would suit you equally well.

An early reply is requested.

P.S.—The fee for the course has been fixed at Rs. 25 per head for the Course.

PUBLIC HEALTH SUB-COMMITTEE OF THE NATIONAL PLANNING

The following is the personnel of the Public Health Sub-Committee of the National Planning Committee.

Chairman, Col. R. N. Chopra, Director of the School of Tropical Medicine, Calcutta, Secretary, Dr. Jivraj N. Mehta; Members, Col. S. S. Sokhey, Director of the Haffkine Institute, Bombay, Dr. Bidhan Chandra Roy, Prof. Salim-uz-Zaman Siddiqi of the Tibbi College, Delhi; Dr. G. V. Deshmukh; Dr. J. C. Ray, Director of the Indian Institute for Medical Research, Rani Rajwade, Dr. Bata, and Col. Abdul Rahman, Chief Medical Officer of Bhopal. A lady doctor will be appointed after consultation.

The Public Health Sub-Committee will deal with the following matters: prescribing standards of dietary and nutrition for all classes of population; consideration of the nature and incidence of the various epidemics which take a heavy toll of life, and suggestion of ways and means for guarding against these scourges; investigation into the volume and causes of infant mortality, as well as mortality among women and suggestion of ways and means of reducing such mortality; provision of the necessary health units, comprising physicians, nurses, surgeons, hospitals and dispensaries; sanatoria and nursing homes; health insurance; medical training and research; complication of vital statistics, including those of birth and death rates; cultivation of necessary drugs and production of medicines to provide the necessary preventive or curative aid and scientific surgical appliances and accessories of the national health services; and any other questions connected with these.

MEDICAL PROFESSION'S ROLE IN NATIONAL PLANNING

The role of the medical profession in national planning was discussed by Dr. B. C. Roy, addressing a meeting under the auspices of the Bombay Medical Association at the G. S. Medical College, Parel, Bombay, some time ago. The medical man, he said, was not pursuing a trade or business, but a profession and a noble one at that. He was a healer, a reliever of pain and distress among his fellow-beings. He had far more opportunities and facilities for national development, because of his intimate association with individuals and families who constituted the nation. For that very reason he had a great responsibility and duty to the community and for the development of the nation.

It was his duty to tell the authorities what was good and necessary for the development of a healthy, strong and robust nation. He had, Dr. Roy continued, a distinct place in the national planning of the country. His service was more essential than that of any other section of the community. The ideal of the medical man should always be service and sacrifice. He should carry with him abundance of

sympathy, patience and tact. With such qualities and equipment he was eminently fitted to take his proper part in the forming of any plan for the whole nation.

Dr. Roy had no doubt that those who were in the profession and those who were about to join it would contribute their due share to national planning and development.—*Times of India.*

ON NATIONALIST PRESIDENT OF THE MEDICAL COUNCIL OF INDIA

In the course of a letter to the Congress President regarding the composition and working of the Medical Council of India, Dr. Satyapal suggests that the Congress Working Committee, which is meeting now in Bombay, should actively interest itself "in tackling this vital problem of national importance."

Dr. Satyapal writes: "It lies in the hands of the Congress Governments to ensure the election of a nationalist President to the Medical Council by nominating to the Council before October, 1939, representatives who would support the national cause."

Through the Congress President, he appeals specially to the Ministers in charge of the Medical portfolios of the Congress Governments for the purpose.

"The Medical Council of India is concerned with the standardization of medical education in India and arranging for the reciprocal recognition of Indian medical qualifications abroad. That this Council does not discharge the latter function in a manner consistent with the honour and prestige of India is well known. That it functions merely as a vassal organization abjectly subservient to the General Medical Council of Great Britain is also common knowledge."

"The Bombay Government has given a very commendable lead to other Congress Governments in this matter. It withdrew its Surgeon-General as its nominee on the Medical Council and appointed Dr. Jivraj Mehta to the Council in his place. This example must be emulated by other Congress Governments without delay."—*United Press.*

MINERAL SPRINGS IN INDIA

Occurrence of two sulphurous springs in Riasi district, Kashmir, is reported by the Geological Survey of India.

The one, which is situated about a quarter of a mile above Khar along the Tawi River, discharges hot water only during winter. It precipitates a good deal of milk of sulphur.

The other spring is, of course, the well-known thermal spring at Tattapani. Its water is apparently possessed of certain therapeutic properties for curing skin diseases and gouty affections. This spring is visited by a large number of people from far and near. The water gives a strong sulphurous odour and maintains a constant high temperature of 70 to 80 degrees.

The name Tattapani is familiar in various parts of India—as in the Sutlej Valley north of Simla, in the coalfield of this name on the northern border of Sirguja, in the Kepili Valley in Assam, etc. at places where thermal mineral springs occur. There are, however, numerous other localities, many well-known places of pilgrimage, where hot springs are among the chief attractions because the waters have been found efficacious in the treatment of disease.

Several years ago the Geological Survey of India compiled a catalogue of the hot springs in this country, but this information is in need of additional information both with regard to the radio-active and mineral character of the waters from a geological aspect and the medicinal properties of the water from a medical point of view.

Just before the Italian occupation of Abyssinia an officer of the Geological Survey of India made a special investigation of several hot springs in that country on behalf of the Emperor of Ethiopia who then contemplated establishing a health resort in his territory. The special apparatus for ascertaining the radio-active property of spring waters in the field employed in Abyssinia is now in the possession of the Geological Survey. This department has, besides, even more delicate laboratory apparatus for the same kind of work and at least three officers who are already familiar with this class of investigation.

It is understood than an exhaustive examination of the mineral springs of India is under consideration and it is hoped that the Geological Survey of India will shortly be able to arrange a programme. But the determination of the physical and chemical constitution of the mineral waters must be supplemented by an investigation of the cures which are said to have been effected by the various waters and for this purpose medical collaboration is necessary to complete the investigation to give the final report its greatest value.

Though mineral springs have till now attracted little public attention in India, spas and hydros in Europe which have grown up at numerous places where mineral springs occur and therapeutic properties of the waters are beyond dispute, are highly popular resorts with those who seek health and holiday.

BOOK REVIEWS

THE MEDICAL ANNUAL: A year book of Treatment and Practitioner's Index: Fifty-seventh year, 1939; Editors:—Drs. H. L. Tidy and A. R. Short. Bristol: John Wright & Sons Ltd. Demy 8 vo., pp. lvi+660. Price Rs. 20/- net.

The Medical Annual of this year has fully maintained its reputation as perhaps the most valuable medical periodical for the practising doctor to keep him abreast of new developments in medicine. The editors and publishers may rightly be congratulated on their success in incorporating practically the whole of the more important recent advances in medicine in such a compact volume of reasonable size.

Among the new developments in medicine the chemotherapy of bacterial infections is perhaps the most important. Dr. Heathcote has given a concise summary of the present position of treatment of bacterial diseases with the various synthetic sulphonamide derivatives.

Another advance in medicine during recent times is the therapeutic use of sex hormones in disease. Dr. Gardiner-Hill has given a comprehensive summary of the present knowledge about these products and has discussed their therapeutic application from scientific and clinical aspects.

Under the heading malaria the 'Ascoli' treatment of splenomegaly with adrenaline should be of interest to practitioners in India.

The sections on nutrition and diet and on anæmias contain a good summary of recent work.

In ophthalmic surgery the new technique suggested by Barkan of San Francisco, in the treatment of glaucoma is of considerable theroretical and practical interest. Sir Stewart Duke-Elder has described the technique in full and it is to be seen whether this technique is of any advantage in the glaucoma of epidemic dropsy.

H. N. M.

THE BASIC MECHANICS OF HUMAN VISION. By R. N. B. Simpkins. Publised by Chapman & Hall. London, WC 2. 1939, Demy 8 vo., pp. vi+228. Price 12/6 net.

"Having been engaged, unceasingly in Ophthalmic Research for many years, I do not hesitate to ask that Members of the Medical Profession, and particularly those specialising in Ophthalmology, will carefully consider this brief depiction of the outcome of my researches".

The author deplored the use of glasses instead of any attempt being made to cure errors of refraction and regards its use as detrimental to the eye.

He is dissatisfied with the lack of mechanical portrayal of the individual and coordinate actions of the different units of visual mechanism and here made an attempt to discover the exact relationship between individual and coordinate actions of the mechanical variants upon which the function of vision depends.

The author has failed in his object although the publishers are to be congratulated for the extremely neat get up of the volume.

B. N. BHADURI.

BULLETIN OF THE OPHTHALMOLOGICAL SOCIETY OF EGYPT. VOL. XXXI, 1939.

The present volume comprises the proceedings of the Ophthalmological Society of Egypt during its thirty-fift Session.

The Scientific contributions consist of sixteen papers half of which are on fundus diseases.

There is an interesting case report on congenital familial cataract with cholestrin crystals by Dr. M. Riad Bey, illustrated with a coloured plate.

There is a paper on capillary angioma of the eye lid in a case of xeroderma pigmentosa by Dr. G. Badir.

Detachment of retina and its treatment received the greatest attention in this volume. The paper by Dr. A. J. Fahrry on how does detachment of retina begin is a very interesting contribution on the subject. The same author discusses the incidence of posterior detachment of vitreous in detachmnt of retina in a joint paper with Dr. M. Lutfy. Although there are two papers on the operative treatment of detachment of retina, there are not sufficient materials to get an idea about the experience of the results of different operations in Egypt.

In a paper on promising treatment of optic atrophy Dr. M. Bakry got very good results from retrobulbar injection of atropine.

B. N. BHADURI.

THE ANTISEPTIC, VOL. XXXVI, No. 6, JUNE, 1939.

This issue of the Journal is a special number on "Ophthalmology in General Practice."

There are twenty-nine scientific contributions in this special number dealing with different subjects of ophthalmic interest. Some of the authors dealt with their subjects from the general practitioners' point of interest. Hence an average practitioner will find this volume very useful.

B. N. BHADURI.

OBITUARY

LADY NIRMALA SIRCAR

We regret to announce the death on August 1, at the age of 69 of Lady Nirmala Sircar, wife of Sir Nilratan Sircar.

Married at the age of 18 to one who was destined to rise to eminence in many spheres of activity, Lady Sircar made a worthy partner in life to her husband and took an active part in the national and cultural movements of this country.

She was renowned for her piety, humility and love of truth. An ardent supporter of Swadeshi, she joined with enthusiasm the memorable national movement against the partition of Bengal. Six years ago, at the opening ceremony of the Swadeshi exhibition in Wellington Square she said that there was no other way for national salvation but Swadeshi.

For calls of charity and medical relief, she was always in the forefront and we still remember her noble efforts during the catastrophic Bihar earthquake. Though, not herself a member of the medical profession, she continued till the very end, to be a trusted friend and adviser to many in the profession.

We mourn the loss of a noble lady and extend our heartfelt sympathy to Sir Nilratan Sircar and members of the bereaved family.

SREEMATI BIRAJMOHINI DE

We are grieved to record the death of Sreemati Birajmohini De, mother of Lieut.-Col. J. C. De, I.M.S., Principal of the Medical College, Calcutta.

She died at the age of 74, after an illness, lasting for about a year. A devoted wife, an affectionate though not too indulgent a mother, kind and charitable to friends, and philanthropic in the cause of medical relief, she will be mourned by many as one whose place cannot be easily filled. Ever mindful of the welfare of her dependents, she made, at the time of her death, adequate provisions for all, not forgetting also the worship of the family deity.

We tender our condolence to Colonel De and members of the bereaved family.

SREEMATI SWARNAMOYI DEVI

We announce with profound regret the death on August 12, at the age of 77, of Sreemati Swarnamoyi Devi, mother of Dr. K. S. Ray. A highly religious-minded and pious lady, she was a generous patron of numerous philanthropic institutions. She was well-known for her charity to hospitals in this part of the country. She died full of age and full of honours at the Calcutta residence of Dr. K. S. Ray, surrounded by most of her relatives.

We offer our sincere condolence to her sons, the Hon'ble Mr. Kumar Sankar Ray, Member, Council of State and Dr. K. S. Ray and to other members of the bereaved family.

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